

Dental

Abstracts

a selection of world dental literature

AMERICAN DENTAL ASSOCIATION

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Lon W. Morrey, D.D.S., editor
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**Dental
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- 1. To present a selection of pertinent literature representative of all points of view within the profession;*
- 2. To provide, by a few hours' reading each month, a survey of the significant advances being made by dentistry throughout the world, as reflected in current dental literature; and*
- 3. To supply enough data in each abstract so that the reader may determine whether he wishes to refer to the original article for more complete information.*

The abstracts are grouped in broad classifications. The specialist will learn from this periodical of work done in other fields as well as in his own. The general practitioner will be able to keep abreast of modern knowledge in the various specialties. Articles from which abstracts have been made are on file in the Library of the American Dental Association and may be borrowed by members of the Association. Requests for articles should be addressed to the Bureau of Library and Indexing Service, American Dental Association, 222 East Superior Street, Chicago 11, Illinois. Only three articles may be borrowed at one time, and they may not be kept longer than one week. No charge is made to Association members for this service.

Prosthetic dentistry

Mucosal inserts—a progress reportIsaih Lew. *J.Prost.Den.* 7:798-803 Nov. 1957

Since the first report (1953) of a technic for placing mucosal inserts on the tissue surface of upper dentures, inserts of many different sizes have been used in different positions. The optimal insert has the following dimensions: diameter, 2.5 mm.; thickness, 1 mm., and length of the stem, 1.5 mm., with a split circular base 3 mm. in diameter and 1.5 mm. thick. The best results have been obtained by positioning four mucosal inserts over the crest of the ridge on each side. These are placed in the region of the lateral incisor, cuspid, first molar and second molar. Two inserts also are placed on the lingual side of the ridge, midway between the ridge inserts and anterior to the greater palatine foramens. Inserts may be attached to an existing denture, provided the occlusal balance, vertical dimension, adaptation and border extension are correct.

The patient's palate, vestibule and ridge are surveyed to determine the thickness of the soft tissues and to locate regions suitable for the insertion of the mucosal inserts. The selected sites are marked with an indelible pencil. Usually 12 sites are selected. The denture to be modified is inserted in the mouth under mild pressure. When the denture is removed (illustration, left), the indelible pencil markings will be transferred to the tissue surface of the denture base.

A large inverted cone bur the same size as the base of the mucosal insert (about 3.5 mm. in diameter) is used to cut a circular hole about 3.5 to 4 mm. in diameter and about 2 mm. deep in the impression surface of the denture base. The base of the mucosal insert is fitted into the prepared hole. The hole should be larger than the base of the insert and deep enough to allow the base of the insert to be continuous with the surface of the denture. The inserts are secured to the denture base by self-curing acrylic resin, which is then highly polished.

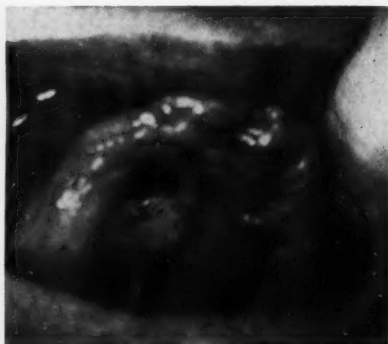
The heads of the inserts are marked with indelible pencil and the denture is placed in the mouth under moderate pressure (illustration, center). When the denture is removed, the marks will have been transferred to the mucous membrane and the pressure will have caused the indentation of the tissue by the heads of the mucosal inserts. Several drops of a local anesthetic are injected into each marked indentation. Cross incisions to the bone are made at the site of each insert with a Bard Parker no. 15 scalpel. The incisions are 6 mm. to 8 mm. long each way. If the soft tissue is too shallow to accommodate the length of the insert, a no. 4 round bur is used to create the required space within the bone.

The denture is scrubbed, sterilized and inserted with a jiggling motion to force the mucosal inserts into the soft tissue at the cross incisions.

Left: A denture with markings transferred from indelible pencil markings previously made on the patient's oral soft tissues

Center: The finished denture with inserts attached and marked with indelible pencil has been removed from the mouth. The pencil marks have been transferred to the mucous membrane

Right: Four weeks after operation the tissue openings are hardly visible



The postpalatal seal will cause a mild blanching when the denture is seated properly.

Once the denture has been placed in the mouth, it must not be removed for an entire week. After the first week the incised regions will appear red and gelatinous. It may take six weeks for normal mucosa to develop and maximum retention to be achieved.

After the first week, the patient is allowed to remove the denture every other day. If pain is experienced on removal, the patient should remove the denture only two times a week. When the healing is complete, the mucosa should appear almost unbroken, with the openings visible to careful scrutiny only under compressed air (illustration, right). After the healing is complete and after six weeks of wear has demonstrated adequate retention, the palatal portion of the denture can be removed if the patient has a high vault.

If the remaining teeth are on only one side of the mouth, mucosal inserts can be used to retain the partial denture on the edentulous side. The inserts provide stability so that little torque or pressure is exerted on the remaining teeth.

Mucosal inserts are not practical in lower dentures because of the relative thinness and sensitivity of the soft tissues covering the mandible.

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Stresses in denture bases

E. A. Wain. *D.Practitioner* 8:37-41 Oct. 1957

Of the three factors—load, material, and shape—which contribute toward impairing structural strength, the part which the third factor plays is not always fully appreciated. By alteration of design it is sometimes possible to distribute the effect of the applied loads on each element of the material in a more uniform manner, thereby improving its strength.

A simple technic for measuring the stress distribution over the surface of a denture has been developed. Lacquer is sprayed on the test surface and allowed to dry. The test surface is then subjected to stress and cracks appear in the lacquer wherever the tension stress exceeds a certain value defined by the threshold sensitivity of

the lacquer (the threshold sensitivity is the value of strain elongation which causes the first cracks in the surface of the test piece).

The recommended technic for a quantitative brittle lacquer strain examination is as follows: The test denture is sprayed with lacquer; the load is applied in increments to the denture until the first crack is formed. As soon as a crack is observed no further increments are applied, and the calibration beam, which was sprayed at the same time, is fully strained and the calibration noted. The lacquer is then chipped off, and suitable adjustments are made to the design of the part. The experiment described is then repeated. Comparisons of the calibrations obtained in the two instances indicate the relative structural strengths of the two denture designs.

It has been found that the cracks are easily seen when the load is applied, but disappear when it is removed, since they have closed up again. When strain gauges are used in conjunction with the lacquer, this problem does not arise. With the use of brittle lacquer, the direction of the principal stresses may be observed at every point; the cracks run perpendicular to the direction of the principal stress which is maximum and tensile. Strain gauges then may be cemented onto the surface and suitably oriented, one being placed in the direction of the maximum principal stress, the other at right angles in the direction of the minor principal stress. From these two measurements, the stress system acting in this region may be computed. The gauges may be placed at the most advantageous points, using the property that a high density of crack formation in the lacquer indicates a point of high stress.

Qualitative use of the lacquer has provided some useful information as to the distribution of stress in dentures during masticatory loading. It has been found that no cracks appear on the labial aspect of the denture; they are confined to the palatal aspect. The magnitude of the tensile stresses is always greater in the palatal aspect, and the region lingual to the incisors is the most heavily stressed. Where cracks appear in the palate, they are never as dense as those lingual to the incisors.

Many materials, including acrylic resin, show notch sensitivity; that is, small notches in the material are capable of reducing the strength of a

part considerably. From a number of experiments it is concluded that the incisal notch is a prime contributing factor in midline fracture and that it is at the base of this notch that the fracture originates. It would appear that a deep incisal notch space is to be avoided and that the region lingual to the incisors should be constructed with a maximum permissible cross-section, as this region of the denture is the most heavily stressed during masticatory loading.

Turner Dental School, University of Manchester, Manchester, England

Unilateral headaches of dental origin: diagnosis and treatment

Woodrow S. Monica and Louis F. Raymond.
J. New Jersey D. Soc. 29:14-16 Sept. 1957

Dentists, sometimes unknowingly, relieve many headaches by mouth rehabilitation; dentists, also unwittingly, cause unilateral headaches through poorly fitting dentures and fixed bridges.

A 77 year old woman complained of recurrent headaches in the right occipital region and pain in the right ear. Four months previously she had been fitted with a partial lower denture. Oral examination disclosed abnormal initial unilateral contacts of the lower left bicuspid and molar. Selective grinding eliminated the abnormal contacts. The headaches diminished, then disappeared.

A 45 year old man stated he had suffered from migraine headaches for 15 years. The pain started at the outer canthus of the left eye and extended to the left temporal region. He received relief only from ergotamine compounds. Oral examination revealed ill-fitting partial upper and lower dentures and a pronounced overbite. His mouth was rehabilitated with a complete upper denture and a partial lower denture. He has remained symptomless.

A 45 year old housewife complained of intense pain that extended from the left condylar region downward along the ramus and anteriorly to the left eye. Several physicians had ruled out organic disease and had offered little relief. A dental examination revealed that her symptoms were related to the insertion of a complete upper

denture and a partial lower denture about five months previously. An abnormal initial contact in the right cuspid, a pronounced overclosure and ill-fitting dentures were noted. A local intra-oral anesthetic infiltration into the left masticatory muscles abolished the headache within three minutes. Two weeks later, oral rehabilitation was completed and in the next two months the patient noted a gradual relief from the headaches.

If a patient's headache can be relieved by local anesthetic infiltration of the masticatory muscles, it strongly indicates that oral rehabilitation will succeed in relieving the headaches.

In a series of 18 patients, 17 were relieved of unilateral headaches by oral rehabilitation.

310 Main Street, Orange, N.J.

Recent considerations of the use of stainless steel appliances in the mouth

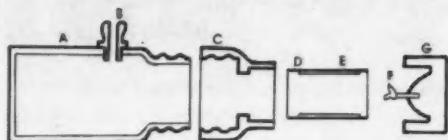
W. C. French. *Bul. Virginia D.A.* 35:22-30
Nov. 1957

A review of the literature shows that, although the stainless steels have not replaced the precious metals for use in oral appliances, stainless steel does have several advantages over the precious metals. Stainless steel can be fabricated more quickly, it can be fabricated with ease while the patient is in the chair, it is not corroded by oral fluids, it has great strength with less bulk, and it has a high elasticity.

Stainless steel, however, does not have the adaptive quality of the precious metals, nor the durability to withstand many changes in fabrication during some treatment programs. Stainless steel is not a substitute for the precious metals, but should be the metal of choice except in those instances where a more adaptable metal is needed or where the repeated application of heat is necessary for fabrication during treatment.

Soldering or resistance spot welding can be used to fasten together pieces of stainless steel. The latter is the method of choice because it minimizes the application of heat to the metal. The repeated application of heat to stainless steel reduces its strength, "springiness" and ability to resist corrosion.

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1

Operative dentistry

Vacuum investing and the use of a modified apparatus

Guy A. Morrant. *D.Practitioner* 7:246-251
May 1957

Modified apparatus for the vacuum investing of small dental castings has been employed successfully at the Institute of Dental Surgery, Eastman Dental Hospital, for a number of years. The apparatus may be made up quite easily in the average dental laboratory.

A glass bottle or jar of about 4 oz. capacity is obtained with an opening somewhat larger than the diameter of the inlay ring to be used (Fig. 1). A hole is drilled in the bottle near the shoulder by means of a mounted carborundum stone kept moist with turpentine. A connector is cemented into the hole to which thick walled rubber tubing can be attached. A rubber connector is constructed to attach the inlay ring to the neck of the bottle. This may be made by forming a wax collar to fit around the neck of the bottle and a similar collar to fit around the edge of the inlay ring. The two collars are then joined together. The wax form is now flaked and packed with inner tube repair compound. This is vulcanized for 15 minutes at 30 pounds pressure to produce a tough, flexible rubber joint. In the



1 Exploded cross-sectional diagram of apparatus. A = glass bottle. B = connector for tube from pump. C = molded rubber connector. D = inlay ring. E = asbestos liner. F = sprued inlay pattern. G = molded rubber sprue base

2 Pouring investment into the bottle under vibration

3 The rubber connector has been placed on the bottle. The inlay ring and sprue base are now inserted into the connector

4 The vacuum is applied with the assembly nearly horizontal

5 The assembly is inverted to fill the ring with the vacuumed investment

same manner, rubber sprue bases may be formed according to the pattern in Figure 1.

In order to break the vacuum rapidly and generally to control the apparatus, a vacuum tap, allowing entry of air into the system, is inserted in the pipeline between the bottle and the source of vacuum. If a motor pump is used, it is a wise precaution to add a bottle trap to catch any investment or moisture which might accidentally be sucked up through the tubing.

The sprued pattern is assembled on the sprue base with the inlay ring and the asbestos liner in the normal way. The investment is mixed in a rubber bowl, preferably with a mechanical mixer. After thorough mixing, the investment is poured quickly into the glass bottle. This is achieved best by placing the bottle on a vibrator and allowing the edge of the mixing bowl to rest on the rim of the bottle (Fig. 2). Care is taken to keep the vacuum outlet uppermost and well clear of the investment.

The rubber connector is then slipped on to the bottle and the inlay ring assembly inserted into the connector (Fig. 3). The vacuum is applied and the bottle vibrated while the assembly is held nearly horizontal (Fig. 4). This presents a large surface area of investment to the vacuum and enables the air to escape rapidly. Even a thick mix of investment may be treated successfully. At this stage, no investment is allowed into the inlay ring. After the major amount of air is evacuated, the investment is allowed to continue bubbling for from 10 to 15 seconds. Then the whole apparatus is tilted so that the investment flows out of the bottle and fills the inlay ring, the vacuum and vibration still being maintained (Fig. 5).

When the ring is full, the vacuum is broken quickly by opening the tap. It is important always to break the vacuum before switching off the vacuum source. The bottle and connector then are removed gently from the inlay ring, which is still held on the vibrator, care being taken to avoid sucking investment from the inlay ring.

This modified vacuum investing apparatus and technic is simple to construct and operate.

If nodules do occur on the resulting casting they usually can be traced to a leak around the sprue base or to the springing of the pattern at an

incorrect angle in the ring. The aim should be to avoid presenting a concave surface of the pattern directly towards the base of the ring, and to angle the pattern so that all rising bubbles will tend to slide off it without being trapped.

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Impression materials for the indirect inlay technic (Neue Wege der indirekten Inlaytechnik)

C. H. Fischer and U. Schaper. *Deut.zahnärztl. Zschr.* 12:993-1002 July 15, 1957

Success with the indirect inlay technic depends a great deal on the basic knowledge of the physical and chemical properties of the impression material selected.

At the Dental Institute of the University of Göttingen, Germany, the applicability and practicability of the indirect inlay technic utilizing certain brands of impression materials were investigated.

The following brands were selected for the tests: (1) the zinc oxide-eugenol cement paste "Momax," made in Sweden; (2) the rubber-base paste Sta-Tic, manufactured in the United States and (3) the silicone rubber (caoutchouc) paste "Lastic 55," produced in Germany.

All three brands investigated were found comparable to reversible or irreversible hydrocolloid impression materials. Within certain limits they were more than adequate in elasticity and stability. They permitted accurate reproduction of the minutest details before and after cavity preparation.

To obtain accurate impressions, the Momax and Sta-Tic pastes require pouring within a comparatively short time after the removal of the impression tray from the patient's mouth. This disadvantage, however, was not present when Lastic 55 paste was used. All stone dies formed in Lastic 55 impressions were uniformly smoother than those made in either Momax or Sta-Tic impressions.

Second casts appeared to be equal in accuracy regardless of which of the three impression materials had been used.

In contrast to the claims made by the manu-

facturers, none of the three brands can be regarded as an "all purpose" impression material, although the quality of stone dies and casts made in Momax, Sta-Tic or Lastic 55 impressions was superior to those made in hydrocolloid impressions, facilitating, therefore, a high quality and accuracy of the inlay when it is completed and inserted.

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Marginal fit of direct acrylic restorations

L. Hirsch and Max M. Weinreb. *J.A.D.A.*
56:13-21 Jan. 1958

A study in two parts was conducted to investigate, by means of the capillary diffusion of dyes, the cavity-sealing properties of direct filling resins as compared to those of established filling materials.

In the first study, 302 cavities were prepared in freshly extracted, intact human teeth. The cavities were filled with various filling materials, immersed in a 2 per cent solution of aniline blue at 37° C., ground and examined for penetration of the dye between the filling and the tooth.

Amalgam fillings showed no dye penetration, and thus implied tightly fitting margins. Direct filling resins were a close second. Fillings of silicates and oxyphosphate cement showed considerable leakage and even diffusion of the dye into the filling material. Zinc oxide-eugenol sealed the cavities tightly, and only rarely did color penetrate into the dentin; occasionally the superficial part of the filling was stained blue.

The results obtained in the first study show that a direct resin filling with good marginal seal can be made, a fact that seems to contradict the rather mediocre results obtained clinically.

In the second study, 90 cavities were prepared, filled and treated with aniline blue as before. The crowns of these teeth were then immersed alternately into hot water at 60° C. for one minute and immediately thereafter into a 2 per cent dye solution (Prontosil Rubrum Solubile) at 4° C. for one minute. This procedure was repeated about 25 times. The teeth were ground and examined.

When the acrylic filling materials were exposed to such temperature changes, their sealing

properties were altered radically. The acrylic fillings started to exhibit leakage and the cold dye penetrated between the filling and the cavity margin. Fillings of silicate and of amalgam were unaffected by temperature changes.

The results indicate that a difference in coefficient of expansion between the acrylic resin and the tooth material is a factor in the subsequent deterioration of the marginal fit of the self-curing acrylic resins. Although the acrylic resins exhibit a satisfactory initial cavity seal, this seal is lost after the fillings are exposed to the constant temperature changes in the oral cavity.

Dental Association of Israel, Tel-Aviv, Israel

Gross manifestations of tissue response to rotary and ultrasonic dental cutting procedures

Arne G. Nielsen and James J. Kennedy. *J.A.D.A.*
56:203-210 Feb. 1958

In studies to evaluate the ultrasonic cutting method, some biologic responses were observed which indicated a possible traumatic effect. The present study, third in a series, was undertaken to assure the investigators that the effects previously noted were not due to the instrument used.

Eighty-eight incisors in 23 guinea pigs were exposed to the maximum amount of ultrasonic cutting with a commercial ultrasonic cutting instrument. Seventy-two incisors in 18 guinea pigs were exposed to the maximum amount of conventional rotary cutting. Sixty-eight incisors in 17 guinea pigs served as controls.

In periodic examinations covering postoperative periods ranging from 58 to 85 days, a number of interesting gross manifestations were observed in the teeth exposed to the cutting procedures. These changes ranged from mild reversible effects to severe irreversible effects: All of the more serious effects were limited to the teeth of the animals in the ultrasonic group. Only minor enamel defects appeared in five teeth (7 per cent) in the animals in the rotary group. No changes were observed in the teeth of the control group.

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Orthodontics

New orthodontic method in instances of distal bite resistant to other treatment

(Eine neue gesichtsorthopädische Behandlungsmethode für therapieresistente Fälle von Distalbiss)

Klaus Opitz. *Fortschr.Kieferorthop.* 16:271-277 Jan. 1956

In most instances of Angle's Class II malocclusion, the Andresen-Häupl treatment is the method of choice. Frequently, however, the desired changes can be accomplished only by complicated technics requiring a highly specialized training, and in some mouths they cannot be obtained at all with this treatment method.

In instances of distal bite which have proved resistant to other treatment methods (Häupl, Korkhaus, or Reichenbach), a new orthodontic method, termed the "inclined plane technic," has been used at the Orthodontic Clinic of the University of Greifswald, Germany. This method combines the main features of previous methods (Hotz, van Thiel, A. M. Schwarz, and Bimler) with the qualities of the Andresen-Häupl apparatus.

The customary types of functional orthodontic appliances exert mechanical forces to move the teeth in the direction desired. These forces are derived from pressure exerted by springs, screws or rubber bands.

The inclined plane technic also can be classified as a functional method. During the day, the patient wears an active plate (A. M. Schwarz) combined with a specially designed "opposing mandibular wire bow." This combination acts simultaneously as an active and passive transmitter of forces produced by the activated muscles either directly, to the alveolar bones or indirectly to the teeth.

The main appliance is worn at night. This combined apparatus consists of the following:

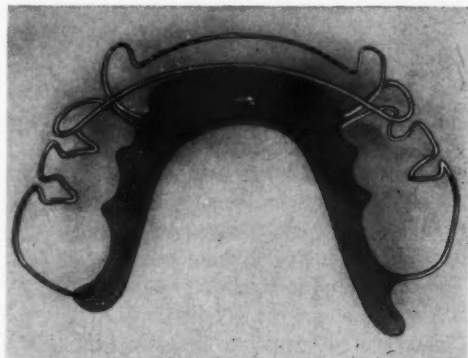
(1) the modified traction plate (Hotz) acting as a shifting factor in an individually adjustable inclined plane; (2) an arrowlike clasp; (3) an opposing mandibular wire bow; (4) a fixation wire bow; (5) several acrylic bolts which are guided by splints; (6) a specially designed jaw mask, and (7) a chin cap adjoining the mask.

Both appliances guide and direct the natural force of tooth eruption, enable the patient to pronounce the "S" sound almost perfectly, and eliminate, after a certain period, the habit of biting the lower lip which is often associated with distal bite.

Treatment time varies from one to four years, and is followed by a retention period.

The condition obtained after use of the inclined plane technic and after the retention period reveals that a reduction in the functional regions of the teeth has been obtained which is in accord with the normal masticatory function.

Figure 1 Lingual clasp with opposing wire bow (above) and combination appliance for correcting resistant distal bite (below)



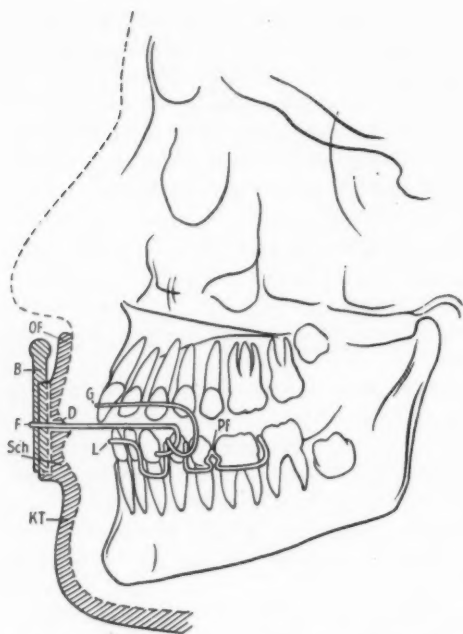


Figure 2 Combination appliance inserted: PF = arrow clasp; G = opposing wire bow; F = fixation bow; B = acrylic bolt; Sch = guiding splint; OF = upper part of the jaw mask; KT = chin cap, and D = opening for the fixation bow

In the majority of instances, a favorable prognosis can be made in regard to development and eruption of the third molars.

This treatment can be employed also for correction of extremely narrow jaws accompanying distal bite, and it can be combined with the Andresen-Häupl method.

The advantages are as follows: (1) treatment can be started comparatively early (during the deciduous and before the mixed dentition); (2) treatment and adjustment time is greatly reduced (intervals of two months are possible, sometimes even desirable); (3) injuries to tissue are rare, and if they occur they are negligible; (4) wearing of the day combination does not impair the patient's facial appearance; (5) speech defects are eliminated, and (6) mouth breathing is replaced by nose breathing.

At the clinic, many hundreds of patients have been treated successfully with the inclined plane technic.

This treatment method is also applicable to general dental practice, and any dentist can master it after he has learned to recognize the correct indication.

Patients with comparatively uncomplicated malocclusions (especially those of Class II) can be treated in the office, and it will not be necessary to refer such patients to already crowded orthodontic clinics or to orthodontic specialists.

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On the possibility of orthodontic treatment of adults

(K voprosu o vozmozhnosti ortodonticheskogo lecheniia vzroslykh)

W. L. Botsvadze. *Stomat., Moscow* 36:61-62 March-April 1957

Many specialists oppose undertaking orthodontic treatment in patients after they have reached the age of 18 to 20. Zaks asserted that the movement of teeth after the age of 15 furthers the development of periodontosis.

Experiences in the Orthodontic Polyclinic of Tiflis proved that the treatment of malposed teeth in adults could be carried out successfully. Three case reports are cited as examples of such treatment.

Case 1. A man, aged 40, complained that his lip and chin were gradually protruding. The diagnosis was prognathism. The bite was restored to normal and the treatment required nine months, from June 1, 1951 to March 5, 1952, with use of the Bynin appliance.

Case 2. A woman, aged 39, came to the clinic on April 20, 1953, because of a painful tongue and difficulty in masticating and speaking. Three years earlier her lower right second bicuspid had erupted; it was lying lingually and irritated the tongue. The lower right molars were missing. An overlay was placed on the four right lower teeth with a steel plate 1 mm. thick and 2 mm. wide soldered horizontally to it, ending in a clasp bent buccally on the first bicuspid. On the second bicuspid a round tube was placed and soldered lingually to the clasp. Elastic traction was used from May 18, 1951, to September 21, 1952. After the second bicuspid was restored, crowns soldered to-

gether were put on both bicusps, serving as a traction device.

Case 3. A woman, aged 36, had a lingually misplaced upper lateral incisor caused by a retained deciduous cuspid root. After the root was extracted, a Katz crown was cemented on the incisor, and its position was corrected in 21 days, between October 2 and October 23, 1951.

These patients as well as many other adult patients were examined in January 1955. Roentgenograms revealed no pathologic changes of bone tissue in the region of the moved teeth.

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Methodology of orthodontic treatment

(Kdy je ortodoncie vědou)

F. Skaloud. *Českoslov.stomat.* 57:163-170
June 1957

Before final thought is given to the mechanics of the projected orthodontic treatment, a number of factors must be considered because there may be conditions present which will modify the usual approach. The orthodontist must be aware not only of the purely dental condition but of some other significant factors which are frequently overlooked in his eagerness to begin the actual course of treatment.

He is faced with the fact that prevention of malocclusion is, to a great extent, practically an impossibility. The changes brought about by the loss of teeth, lack of adequate restorations, faulty nutrition and dental and general physical neglect are accomplished facts.

Tooth irregularities never should be corrected without consideration of the unfavorable effect which the attempted correction may have on the patient's face. An adequately functioning occlusion should not be sacrificed for the sole purpose of altering the patient's facial appearance for esthetic reasons.

Modern orthodontic practice offers numerous benefits not only for children but for adolescents and adults with tooth disharmonies and malocclusion, provided the orthodontist comprehends the necessity of following a cautious and deliberate approach to the procedure known as serial extraction. The recommended procedure, especially in borderline conditions, is to attempt first orthodontic treatment without extraction. If serial extraction later appears the only solution, there is no alternative except to proceed slowly with the removal of teeth in a proper sequence and at proper intervals.

The results of modern orthodontic treatment methods, based less on the effects produced by mechanical appliances than on etiologic and biologic factors, have been highly satisfactory. Orthodontic treatment of the mixed and permanent dentition may even lead to a "golden age" in orthodontics.

Czechoslovakian orthodontists, however, are not satisfied with the term "orthodontics," and have proposed that the more suitable term "orofacial orthopedics" should be used. German dentistry already has abandoned the previously used term "Orthodontie," by replacing it with "Kieferorthopädie" (orthopedics of the jaws).

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Roentgenology

Significance of radiobiologic research for dentistry

(Die Bedeutung der radiobiologischen Forschung in der Zahnheilkunde)

James A. English. *Schweiz. Mschr. Zahnk.* 67:150-164 Feb. 1957

During the last 50 years radiobiologic research has developed enormously. There are now so many data available that dental researchers are restricted to comparatively small segments of the entire radiobiologic field. The region of concern is limited by the different wavelengths of the specific types of radiation investigated.

Dentists are interested mainly in rays having wavelengths between 0.06 and 120 angstroms because rays with other wavelengths are seldom used in dental practice.

Most significant for dentistry is the radiobiologic analysis of the diffraction patterns produced when crystals are exposed to roentgen

rays. The study of the molecular architecture with roentgen-ray diffraction began about 45 years ago, when Lane and Bragg determined the structure of simple inorganic crystals (sodium chloride) and of simple carbon compounds (graphite and diamond). Since then the knowledge of the chemical structures of biologic compounds of the hard tissues of teeth and oral bones has been increased.

In studies of natural crystalline substances such as enamel, the previously compiled knowledge of structural properties of chemically pure substances has been applied. Roentgen-ray diffractograms of the enamel of human teeth were compared with diffractions of chemically pure substances. The similarity of enamel to apatite crystals was thereby established.

Specimens of tooth and bone structures in which no decalcification has taken place were studied. Osseous tissue sections were called "anorganic bones" by Fred Losee in his report on the "take" of heterogenous implantations in the maxillofacial region.

There have been many clinical research efforts to develop a suitable method to facilitate roentgenographic tooth examinations for large parts of the population. By realizing the technical difficulties and time expenditures required in standard roentgenographic technics—in which frequently from 10 to 14 separate films have to be

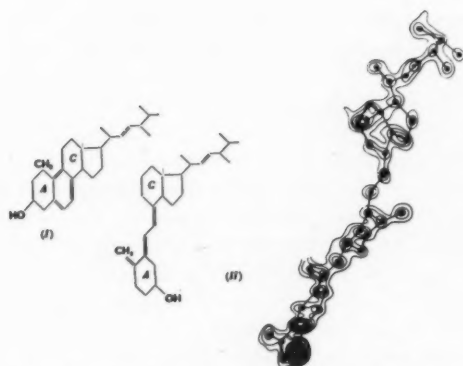


Figure 1 Analysis of the crystal structure of calciferol (vitamin D_2). Left: Two possible structural formulas. Right: Crystal structure analysis reveals that the chemical structural formula (center) is correct



Figure 2 Microroentgenogram of an alveolar bone. Variations in density of osseous tissue result in the variable penetration of roentgen rays, thereby producing the image. Lighter spots designate lack of inorganic salts

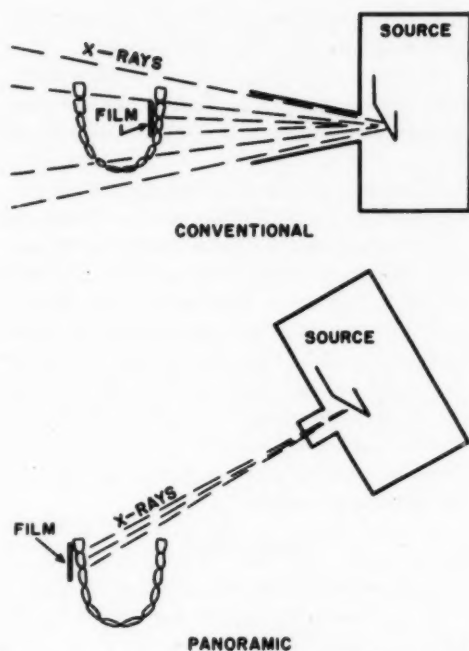


Figure 3 Comparison between conventional and panoramic roentgenography. The film is placed intraorally (conventional) and extraorally (panoramic). The panoramic technic permits the passing of a small roentgen beam through an arc, exposing each tooth successively. Both dentitions can be reproduced on a long continuous film strip.

used—S. Blackman of the Royal Dental Hospital in London and several radiobiologic researchers of the United States National Bureau of Standards in Washington have developed panoramic technics in which only a single film strip is used. If a continuous strip of film is placed on the buccal aspects of the jaw, it is possible by swinging the roentgen-ray beam through a 90 degree arc to expose simultaneously both sets of teeth. The total amount of roentgen rays received by the maxillofacial region is thereby considerably decreased.

More attention should be paid by dentists to the individual roentgen-ray dosage applied during roentgen diagnosis. This dosage can be greatly reduced if an aluminum filter (1 mm.) is attached to the x-ray machine. This filter removes some of the softer roentgen rays which, otherwise, are almost completely absorbed in patients

and which, therefore, do not make any contribution to the image reproduced by roentgenography. If absorbed in patients, however, these softer roentgen rays contribute to the total radiation dosage.

Seeman and Cleare have investigated the effect of aluminum filters placed in dental x-ray machines. These authors established that the total dose received by facial and oral tissues after aluminum filtration was reduced by over 50 per cent. The total dosage to patients can also be decreased if the new, faster Eastman films are used in dental practice.

There are still a few dental x-ray machines in use which have no cones. An unnecessarily enlarged region of the patient's body is thereby exposed to radiation.

Every dental student is taught to avoid holding the film in the patient's mouth. In the past, malignancy of the operator's hands has resulted from such procedure. Under ordinary conditions, the operator who remains out of the path of the roentgen beam and about three feet from the center of radiation requires no additional protection.

Hypoplasia of enamel frequently occurs as a sequela to diseases. If children are afflicted with febrile disorders during tooth development, horizontal lines appear across the incisors. Similar hypoplastic lesions are caused by large doses of local radiation.

The effect of radiation on tooth development in rats was studied by English, Schlack and Ellinger. In the radiated rats four lower incisors erupted instead of two in nonradiated animals. The re-establishment of odontogenesis was delayed until differentiation of new odontogenic cells from the anlage had taken place. After these newly formed cells had differentiated, the tooth germs were no longer attached to the original teeth which had erupted prior to radiation. What appears to be four incisors actually represents a double growth from two tooth germs.

In ionizing radiation, dentistry possesses a tool that is of tremendous importance in dental research and practice. It promises progress toward improved methods in diagnosis and treatment. Underneath the obvious benefits of ionizing radiation, however, there lurks a danger. Just as radioactive isotopes are able to destroy tumor cells,

they can destroy or alter tissues of value if proper precautions are not taken.

As mankind progresses farther into the atomic age, there seems to be hope that different types of radiation will provide many additional benefits. Many of these benefits can be expected to be of immense service to dentistry.

429 Oxford Street, London W 1, England

The truth about the x-ray scare

A. E. Hotchner. *This Week* 8-9, 28-29
Feb. 22, 1958

In recent months a widespread scare has been built up about roentgen rays. In June 1957 the findings of the Special Sub-committee on Radiation of the Congressional Committee on Atomic Energy were made public. Shortly after, a report prepared for the National Academy of Sciences warned that roentgenograms of the teeth, chest and other portions of the body could be dangerous because some radiation reached the reproductive organs. Some people are refusing roentgenography that would be helpful in diagnosing their illnesses.

An important factor in the big scare is the atmosphere of fear built up by the radiation perils of A-bombs and H-bombs. The fact is that x-ray machines and fluoroscopes when not used properly can damage the reproductive cells. These cells are very sensitive to radiation, and damage to them can cause genetic mutations in future generations. The National Academy of Sciences has recommended as a safety limit that the average person receive no more than 10 r of man-made radiation to the reproductive organs from birth to the age of 30.

How much exposure does a person get from an ordinary, properly executed roentgenogram? A team of three physicians made an extensive study of routine roentgenography done at a medical center and found the following: roentgenograms of the head and chest of children between the ages of 2 and 11 resulted in 0 gonad exposure; abdomen roentgenograms in this group registered a negligible 0.25 gonad exposure; skull and chest roentgenograms for adults showed 0 gonad dosage and abdomen roentgenograms for adults

varied from 0.075 to 0. Roentgenograms of the teeth resulted in 0.00009 gonad exposure.

Another study showed that the average person can safely undergo 73 complete dental roentgenographic examinations within a span of 30 years.

Harry Lyons, dean of the School of Dentistry, Medical College of Virginia, states: "There has been a lot of loose unsupported talk that all x-ray examinations are dangerous and their dangers outweigh their value. This fear is unfounded. A recent experiment in our dental school indicates that the amount of radiation reaching reproductive organs in the course of a complete dental x-ray examination is infinitesimal. In our experiment it was impossible to detect more than 0.00009 of one roentgen reaching the region of the reproductive organs."

Robert J. Nelsen, of the National Committee on Radiation Protection, states: "There is no scientific evidence that the proper use of modern x-ray equipment for dental diagnostic purposes will be harmful to the patient and there is no justification for concern by patients undergoing routine x-ray examinations."

United Newspapers Magazine Corporation,
485 Lexington Avenue, New York 17, N.Y.

Epidermoid carcinoma of the lower lip: results of radiation therapy of the local lesion

William S. Gladstone and H. Dabney Kerr.
Am.J.Roentg. 79:101-113 Jan. 1958

Between 1931 and 1951, 519 consecutive unselected patients with epidermoid carcinoma of the lower lip were treated by irradiation at the State University of Iowa Hospitals. Carcinoma of the lower lip constituted 5 per cent of the total cancer admissions to this hospital during that period. This lesion constitutes about 25 to 30 per cent of all oral carcinomas. The average and mean ages in the series were 62.9 and 64 years, respectively. Of the patients, 3.1 per cent were women. The right or left lateral aspects of the lip were more frequently involved than the midline; the angle of the mouth was rarely involved. Contact or superficial roentgenotherapy was used in 81 per cent of the patients, deep roentgeno-

therapy in 3.3 per cent, and radium in 5.1 per cent, with combinations of these technics in 10.6 per cent.

The absolute three year and five year survival rates were 74.2 per cent and 65.1 per cent, respectively.

Radiation therapy is as effective in the control of carcinoma of the lower lip as any method now available. The cure rate in carcinoma of the lower lip decreases with an increase in the size of the lesion. Metastasis from carcinoma of the lower lip follows a direct lymphatic route to the anterior cervical lymph nodes. The cure rate of carcinoma of the lower lip treated by irradiation has risen by 10 per cent in the past ten years.

458 West South Street, Kalamazoo, Mich.

Health hazards in the diagnostic use of x-ray

Paul C. Hodges. *J.A.M.A.* 166:577-584
Feb. 8, 1958

A working rule in the designing of atomic energy plants is to provide shielding such that workers and bystanders will receive not more than 300 milliroentgens whole body dose per week or 210 r accumulated dose by the age of 60. These figures do not imply that anyone knows the threshold leukemogenic dose, or the quantitative relation of dosage to radiation-induced mutations, or any other quantitative facts about radiation exposure accurately enough to justify laws requiring a patient to carry a lifetime radiation passport. The value 300 mr per week total body dose at best is an educated guess.

Extrapolation from fractional body dose to total body dose cannot be done with precision. The precise measurement of the doses delivered to various parts of the body during fluoroscopy and the making of roentgenograms is a difficult, time-consuming affair and values for these doses computed from the measured output at the x-ray tube may be in error by several hundred per cent, even when such measurements and computations are made by competent radiation physicists.

Roentgenologists must expect that presently there will be regulations concerning the safety devices that can be built into their machines and incorporated into their technics.

Physicians and dentists can assist roentgenology and thereby their patients and themselves by spreading the gospel that, unlike other diagnostic procedures where thoroughness and repetition are prime virtues, roentgenography should be used parsimoniously.

The permissible dose of radiation to the gonads or any other tissue of a patient is always the same, regardless of what may have happened in the past; namely, the smallest amount that is consistent with the patient's present clinical needs. The implementation of this concept requires that roentgenologists continue to seek and apply technical means for reducing the dose delivered in the making of films, and that clinicians refer patients for initial or repeat roentgen-ray examinations only after careful consideration of the possible clinical advantages, never as a thoughtless routine, a form of laying on of hands, or merely because the patient has requested such examinations.

Practitioners should do everything possible to reduce the amount of radiation received by a patient's gonads and other tissues in connection with diagnostic radiation. As the evidence accumulates, however, it becomes clear that, with the possible exception of those examinations in which the ovary or the testis inevitably lies in the direct beam, diagnostic roentgenology, even as it is being practiced today by qualified roentgenologists, is not contributing 30-year gonadal doses that are significant relative to the background radiation.

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Potentiating effects of prenatal x-irradiation on dental caries in the rat

B. H. Ershoff and L. A. Bavetta.
Proc. Soc. Exper. Biol. & Med. 97:202-205
Jan. 1958

Forty female rats of the Long-Evans strain were divided at random into four groups of ten rats each and were mated to males of proven fertility. The animals in Group 1 served as controls. Those in Groups 2, 3 and 4 received a single roentgen-ray exposure of 150 r on the eighteenth, four-

tenth or tenth day of pregnancy, respectively.

Twelve male and 12 female rats (consisting of at least one male and one female from each litter) were selected at weaning from the young of each of the afore-named groups. Animals were fed *ad libitum* a cariogenic diet containing skim milk, similar to diet 635 of McClure and Folk (1953). In addition, 12 male and 12 female rats similar to those mentioned were selected at weaning from the young of each group and were continued on the same natural food ration that had been fed during pregnancy and lactation. After 90 days, all rats were sacrificed and the lower teeth were evaluated for caries according to the procedure of McClure and Folk.

Exposure to roentgen rays during certain periods of prenatal development significantly increased the severity of dental caries in rats subsequently fed a cariogenic ration containing skim milk. The effects of irradiation were most severe on the offspring of rats irradiated on the tenth day of pregnancy; 70.8 per cent of the rats in the latter group developed caries when fed the ration containing skim milk, with an average severity score of 32.0 per carious rat, in contrast to a 58.3 per cent incidence of caries and an average severity score of 3.1 per carious rat for the offspring of nonirradiated rats fed a similar diet.

It would appear that irradiation enhanced the severity of the carious lesion but had little if any effect on its incidence. The offspring of rats irradiated on the fourteenth day of pregnancy also exhibited a significant increase in severity of caries when fed the ration containing skim milk (average severity score, 15.4 per carious rat). No increase in the severity of dental caries occurred in rats whose mothers were irradiated on the eighteenth day of pregnancy. Whereas irradiation during certain periods of prenatal development significantly increased the severity of dental caries in rats fed a cariogenic ration containing skim milk, it had no such effect on rats maintained on the stock ration. The incidence of caries in rats fed the latter diet did not exceed 10 per cent in any of the groups, with such lesions as did occur being minimal in severity.

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A radiographic survey of edentulous mouths

Roy Storer. *Brit.D.J.* 103:344-347 Nov. 19, 1957

Five hundred routine out-patients in the prosthetic department of the Liverpool Dental Hospital, all of whom had had their teeth extracted at least two years previously, were examined roentgenographically, periapical films being taken of the upper and lower jaws. None of the patients was aware of any retained roots or other abnormalities in the jaws.

Of the 500 patients, 186 (37.2 per cent) were found to have retained roots or other abnormalities. The patients ranged in age from 10 to 79 years; the majority (317, or 63.4 per cent) were in the 40 to 59 year age group.

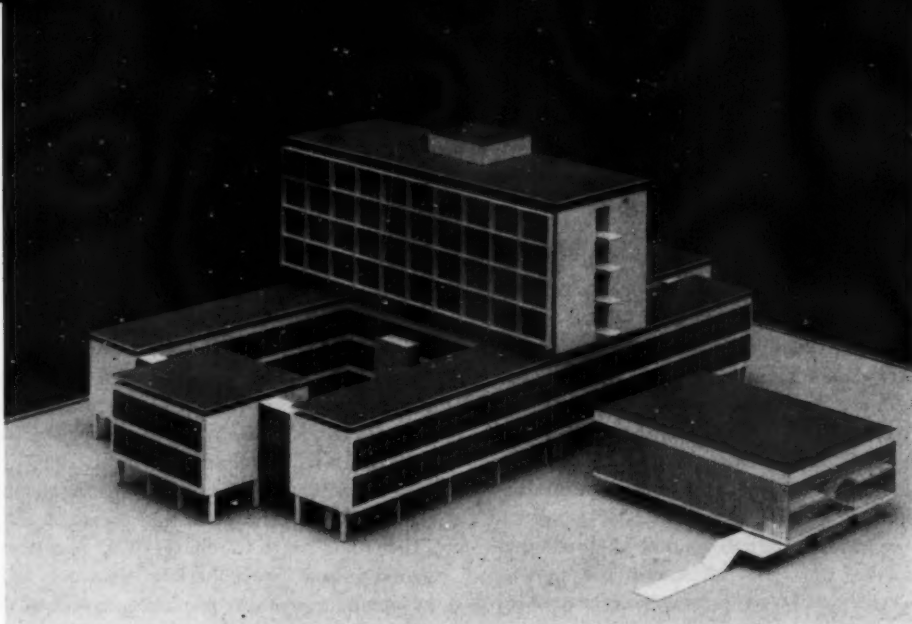
Retained roots or apices only were found in 126 patients; retained roots or apices with other abnormalities, 21 patients; unerupted teeth only, 17 patients; cysts, granulomas or residual infection only, 15 patients, and other findings, 7 patients.

The greatest number of retained roots and apices was found in the upper first bicuspid and second molar regions (54 and 60, respectively, of a total of 255 for both jaws). Thirty-three unerupted teeth were found in 29 patients. The upper third molar, upper cuspid, and lower third molar, in that order, were most commonly unerupted.

The high percentage of patients with positive findings in this survey would seem to indicate that all edentulous patients who first request treatment should be examined roentgenographically. Roentgenograms of the alveolar bone are of particular value in the lower anterior region.

Examination of the films taken in this survey suggests that sufficient information regarding possible retained elements in the upper jaw can be obtained with an occlusal film; further periapical films can be taken of any suspected regions, if necessary. Inasmuch as an occlusal film of the lower jaw sometimes will not reveal retained elements in the lower anterior region because of the thick lower cortical border of the mandible, a periapical film should be taken of this region.

University of Liverpool, Liverpool, England



Education

The new building of the Dental School of the University of Freiburg/Breisgau, Germany
(Richtfest der Zahn- und Kieferklinik der Universität Freiburg im Breisgau)

Hans Rehm and Hans Paul.

Deut.zahnärztl.Zschr. 12:1207 Sept. 1, 1957

The Dental School of the University of Freiburg/Breisgau is one of the oldest dental colleges of Germany offering a four-year curriculum leading to the degree of Doctor of Dental Medicine (Dr.med.dent.).

This school is fully accredited by the councils on dental education of all German dental associations. It provides opportunities for selected, qualified individuals to study dentistry under the best educational conditions and in accordance with the highest standards.

The close association with the allied professions of medicine, pharmacology and nursing which undergraduate students enjoy gives them excellent training for the cooperation with these professions which is necessary for dental practice.

The city of Freiburg/Breisgau with a population of 120,000 (1952) provides abundant clinical material. Each student is assigned a variety of patients sufficient to afford extensive experience in diagnosis and treatment. It is highly desirable that students who have selected dentistry as their profession should exceed the minimum admission requirements. To encourage higher standards of preprofessional training, arrangements have been made with other university faculties for combining courses.

During World War II, most of the buildings of the Dental School were destroyed, and the school was evacuated to Günterstal, one of the suburbs of Freiburg. The provisional buildings, however, were inadequate. It was possible to accept not more than 70 students and many applicants for admission had to be turned down.

The new building of the dental school, on the university campus, is in the final stage of construction. It will meet the exacting demands of modern teaching in both the clinical and technological phases of dentistry. It is planned to accommodate from 200 to 250 students, and will be one of the most modern dental institutes not only of Germany but of the world.

The Dental School of the University of Freiburg/Breisgau will celebrate the opening of its new building at the beginning of the 1959 summer term.

Torplatz 1, Freiburg-Günterstal, Germany

A regional approach to increasing dental training facilities

Russell S. Poor. *Am.J.Pub.Health* 47:1502-1507
Dec. 1957

Since 1949 a "contract-for-services" program has been in effect among 14 Southern states, to provide education in the fields of medicine, dentistry and veterinary medicine. States lacking educational facilities adequate to meet their needs: (1) contract with the Southern Regional Education Board to arrange places for quotas of students in institutions outside their control, (2) certify applicants as bona fide residents of the applying state, and (3) pay a stipulated sum for each student enrolled (\$1,500 per student per year for dentistry). The Southern Regional Education Board then contracts with the receiving institutions to accept these students. The institutions enroll the students provided they meet admission standards, and do not charge them out-of-state fees.

Dental education under the "contract-for-services" agreement is provided by Emory University, Loyola University of New Orleans, Medical College of Virginia, Meharry Medical College, University of Maryland, and the University of Tennessee. Under the agreement, 113 dental students were admitted to these six schools in 1949-1950; by 1955-1956, there were 265.

In 1953, 11 Western states and two territories formed the Western Interstate Commission for Higher Education, primarily to provide education in dentistry, medicine and veterinary medicine on a contract-for-services basis. A similar compact has been approved by the New England states, and a New England Board of Higher Education has been established.

In the 14 Southern states, by August 1956 there were 204 dental graduates under the program, which incurred a total cost of \$1,900,000 to the applying states.

The Southern Regional Education Board has sponsored a study of dental education in the South, recently concluded. Population studies indicate that by 1975 the South will add 14,600,000 people to its current population of 50,000,000. Because of the South's rising per-capita income, the shift to urbanization and rising educational

levels, it is predicted that by 1975 the demand for dental services in the South will compare more nearly with that in the nation today, that is, one dentist per \$4,000,000 of personal income or one dentist per 1,800 people. This would require a dental force of 36,000 by 1975, including 28,800 new dental graduates. In 1956-1957 the 11 Southern dental schools enrolled 2,904 students—22.3 per cent of the national enrollment in dental schools. In 1956, 679 dentists were graduated from Southern dental schools.

Some Southern states are preparing to meet the needs for dentists in their areas. Alabama (1948) and North Carolina (1950) opened new dental schools; West Virginia has a new school in operation; Kentucky plans to open its new state dental school in 1959, and the South Carolina legislature has authorized a school for the near future. The Commission on Dental Education in the South has recommended additional dental schools in three parts of the region: (1) Florida, (2) the southwestern subregion (Texas, Oklahoma, Louisiana, Arkansas), and (3) in the upper south subregion (Virginia, Maryland and Delaware), providing that existing dental schools cannot expand their capacity sufficiently to meet the student demand and the expected public demand for dental services. The Commission has recommended the development of graduate dental education to train teachers of dentistry, the encouragement of dental research, and the training of more auxiliary dental personnel and the use of these personnel in greater numbers.

University of Florida, Gainesville, Fla.

A school of stomatology

(Una escola de estomatologia)

J. Conde. *J.estomat.,Lisbon* 4:21,29 Jan.-Feb. 1957

Plans are being made to establish a National School of Stomatology in Portugal. The projected school will enable physicians to add to their knowledge relating to the mouth and its diseases, and to acquire the technics necessary to use dental instruments.

Teachers should be selected from among the excellent stomatologists of Portugal. To invite sto-

matologists from other countries to be part of the faculty of the planned school of stomatology would be to deprive excellent Portuguese stomatologists, of whom there are many, of the credit they deserve.

The school should be essentially practical. The students should be prepared thoroughly in stomatology, otherwise they may swell the present number of general practitioners who have spent a few days in a department of stomatology, a few days in a dental department and then taken up residence in one of the provinces where they set themselves up in the practice of prosthodontics and orthodontics.

Classes in theory should be kept to a minimum, and clinical practice should be as wide as possible, with the teacher explaining the theory behind the clinical work. Lectures should be given by stomatologists from Portugal and other countries. Films and television should be used to show the technics of well-known stomatologists. The school should undertake dental health education. Treatments given in the school to the public should be economical and available to all in need of dental care.

The organization of a school of stomatology will prove to the public the importance of stomatology as a medical specialty, and will indicate that the practice of this specialty should be permitted only to physicians.

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How to start a research program and sources of support

Joseph F. Volker. *J.D.Educ.* 21:323-329
Nov. 1957

American dental schools have excelled in transmitting knowledge and skills to students, and in rendering clinical service to the community, but their efforts toward the extension of knowledge by research have been comparatively ineffectual.

The most important single factor in the development of an active research program is key personnel. If careers in dental research were given the same aura of glamor, the same protection of board certification, and financial compensation comparable to those in the dental specialties, dental research could compete more favorably for key personnel. Such persons, in addition to inaugurating research programs of their own, would serve as catalysts to promote reactions between basic science personnel and clinical personnel.

Time is indispensable for creative thinking. Dentistry might profit from the example of its sister health science, medicine, wherein there has been general realization that the teaching staff should have at least half time free for research and self-development. Dentistry might heed industry's example and advertise for established basic science researchers.

Once a researcher has been obtained, the dental school should develop its own in-service training program. A fertile source of supply is the graduate school. Space and basic equipment for research must be provided. When there are available trained personnel with adequate time, space, and basic equipment, financial support usually is forthcoming.

Among the potential sources of financial support are university funds, alumni, local foundations, local dental groups, the armed services, national philanthropic foundations, industrial foundations and industry.

Regardless of the source of the funds, the application should (1) state clearly the problem, (2) give background material bearing on the problem, (3) outline the experimental procedures contemplated, (4) give the biographies of the people who are to do the work, and (5) list the detailed budgetary requirements of the study. The initial research programs should not be beyond the abilities of the institution's personnel and physical equipment.

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Public health
dentistry

**Fluoridation of drinking water
for caries prevention:**

the Tiel-Culemborg experiment

(Caries prophylaxe met fluoriden: Experiment
Tiel-Culemborg)

O. Backer Dirks. *Belg.Tschr.Stomat.* 54:361-370
April-June 1957

The European opponents of fluoridation have based their objection to fluoridation of drinking water mainly on the following assumptions:

1. American data on fluoridation are not applicable to European conditions.

2. The required optimal fluoride concentration in drinking water of European communities cannot be based on data compiled in the United States because of the presumed lower water consumption in most of the European countries.

3. Significant nutritional differences exist between many European countries and the United States which may influence the caries-preventive effect of fluoridation.

In the towns of Tiel and Culemborg, near Utrecht, the Netherlands, a large-scale fluoridation experiment was started on March 9, 1953. The public water supply of Tiel was artificially enriched with 1 ppm sodium fluoride. The neighboring community, Culemborg, served as a control city.

The purpose of this study consists of the following: (1) to establish the caries incidence in Tiel prior to fluoridation (1952); (2) to determine by periodic examinations the reduction in the caries frequency in Tiel after fluoridation (1953 to 1957); (3) to establish the caries incidence in nonfluoridated Culemborg, and (4) to evaluate and compare all data obtained in Tiel with those compiled in Culemborg.

Special emphasis will be placed not only in the evaluation of the dental condition in preschool and school children but also in that in juveniles.

The incidence of interproximal caries will be ascertained with roentgenograms, and that of occlusal caries measured according to established indexes.

At present, 500 children in Tiel and about the same number of children in Culemborg are examined biannually by dentists and physicians. The appearance of mottled enamel is recorded and fluoride urinalyses are conducted.

The results of the fluoridation experiment in Tiel-Culemborg will be published periodically.

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**Caries frequency in Korean children
now residing in Czechoslovakia**

(Beobachtung der Kariesanfälligkeit
koreanischer Kinder in der Tschechoslowakei)

Jaromir Novotný. *Deut.Stomat.* 7:649-659
Nov. 1957

At the Institute for Dental Research of the University of Prague, 508 Korean children (340 boys and 168 girls) and 399 Czech children (213 boys and 186 girls) were examined to determine whether a difference in caries frequency exists based on racial characteristics. Both groups consisted of school children of the same age (from 10 to 17 years old).

In 1954 and 1955, three series of investigations resulted in the following findings:

1. No significant difference in the inherited susceptibility to caries was determinable.

2. The caries frequency, assessed by examination of the permanent dentition and by establishing and recording the DMF index in each child of both racial groups, appeared to be different. Carious lesions were found in 48.8 per cent of the teeth of Korean children and in almost 90 per cent of the teeth of Czech children.

3. More carious lesions were found in the lower first permanent molars than in the upper first permanent molars in Korean children. In Czech children, the upper first permanent molars showed more carious lesions than the lower first permanent molars. The first permanent molars, however, do not provide a reliable index for the total caries experience.

4. More carious lesions were found in the lower permanent teeth than in the upper permanent teeth in Korean children. The Czech children, however, showed scarcely any difference between the number of carious lesions in the upper and the lower permanent teeth.

5. The permanent teeth of Korean children showed a frequently occurring enamel defect (incomplete calcification) which was absent in the permanent teeth of Czech children.

6. The Korean children who were born in Czechoslovakia showed a higher caries frequency (especially in the second permanent molars) than the children born in Korea. Although the caries incidence in Korean children born in Czechoslovakia was not as high as that in Czech children, the environmental changes and the more cariogenic food consumed must be considered as the main causative factors for this increase in caries incidence.

Institute for Dental Research, University of Prague, Czechoslovakia

Incidence of dental fluorosis and caries in deciduous and permanent teeth in Isparta, Turkey

(Die Fluoroseerscheinungen und Kariesindizes in den Milch- und bleibenden Zähnen in Isparta, Türkei)

Pertev Ata. *Zschr. prophyl. Med.* 1:194-198 Aug.-Oct. 1957

Until 1954, the drinking water of Isparta, a Turkish city with a population of about 20,000, contained 4.3 ppm fluoride. Since then, drinking water with a fluoride content of 1.6 ppm was provided from other sources.

In 1956, the teeth of the Ispartan children were examined for dental fluorosis and caries.

The neighboring communities—Izmit with a fluoride content of 0.225 ppm in the drinking water, Atalya, with 0.26 ppm, and Afyon, with 0.25 ppm—were used as control cities.

The results were as follows:

1. Fifty per cent of the Ispartan children from seven to eight years old had dental fluorosis. The enamel of the deciduous teeth contained white or brown spots, located mainly in the regions calci-

fied after birth. This seems to indicate that mottled enamel is caused by the amount of fluoride present in mother's milk, foodstuffs and drinking water.

2. In Ispartan children from 12 to 14 years old, dental fluorosis was present in almost every child. The usually symmetrical, chalky white or light brown spots in the enamel of the permanent teeth showed a definite boundary.

3. In the permanent teeth of Ispartan adults, the spots had no visible boundary lines. The enamel appeared uniformly dark brown; there were signs of an imperfect calcification and hypoplasia.

4. Histologic examination of specimens taken from extracted teeth revealed that the spots did not penetrate the deeper regions of the enamel. In the majority of instances, the enamel between the surface and the dentin remained translucent.

5. In a minority of instances, however, the chronic dental fluorosis had caused morphologic changes in tooth structures. The enamel showed deep horizontal and vertical fissures. Teeth without enamel on the incisal parts of the crowns were observed.

6. The deciduous teeth of 47.8 per cent of the seven and eight year old Ispartan children were free from carious lesions. In Izmit, the comparative figure was 11 per cent, and in Atalya, 6.2 per cent. The def rate in Isparta was 1.2, in Izmit 5, and in Atalya, 6 per child.

7. There were no significant differences in tooth development and eruption between the children of the four communities.

8. The caries-preventive effect of fluoride appeared to be more evident in the permanent than in the deciduous dentition. The permanent teeth of 63 per cent of the 12 to 15 year old children of Isparta were free from carious lesions. The comparative figures were: Izmit, 29.5 per cent, and Afyon, 19 per cent. The DMF rate per child was 0.84 in Isparta, 2.3 in Izmit and 2.65 in Afyon.

9. The teeth of 190 children, from 12 to 14 years old, who were born outside of Isparta but but who had resided within the city's limits for at least three years, also were examined. The permanent teeth of 51 per cent of this group were free from carious lesions. The DMF rate per child was 1.06.

10. The reduction in the incidence of caries was evident in all teeth of the inhabitants of Isparta but appeared to be most conspicuous in the upper incisors and cuspids.

Cumhuriyet Cad. 49, Istanbul-Taksim, Turkey

Organization and working methods of a district stomatologist

(Opyt organizatsionn-metodicheskoi raboty raionnago stomatologa)

K. I. Zolotukhin. *Stomat., Moscow* 36:4:74-75
July-Aug. 1957

In 1954 there were two and a half sets of dental equipment in the stomatologic polyclinic of the Gelendzhiksk District Health Department and two dental clinics in the outlying areas. In 1957 a central stomatologic polyclinic was established with five and a half working units, four clinics in the country, and one mobile dental clinic. The old foot engines and primitive dental chairs were replaced with modern equipment, as were the dental instruments.

The staff of the mobile dental clinic conducts dental health education in the villages, presenting lectures and films. In 1956 the mobile clinic provided dental care to the residents of three villages, one state-owned collective farm, two kindergartens and to the children in urban schools. A school nurse and a student nurse assist the stomatologist. In 1956 the staff of the mobile clinic worked 734 hours. Fillings were inserted in 1,439 teeth, 755 teeth were extracted, and calculus was removed from the teeth of 375 patients. Gingivitis was treated in 38 patients, periodontosis in eight patients, and 208 children received topical fluoride treatments. The treated patients numbered 915, of whom 447 were inhabitants of the villages, 334 were school children and 134 were children of preschool age.

Bringing the mobile dental clinic to the collective farms saved an estimated 1,919 working days for patients in 1956.

District stomatologists meet every two months for lectures and a discussion of the contents of *Stomatologiya*.

It has been proposed that a dental polyclinic be organized in each area with a minimum of

ten stomatologists. The hospital in which the dental polyclinic would be located will be responsible for maintenance care.

The chief stomatologist visits the village dental clinics monthly for instruction and consultation. It has been proposed that orthodontic treatment be provided in the central polyclinic and that profits from prosthetic dentistry be used to improve dental aid throughout the district.

District Stomatologic Polyclinic, Krasnodarsk, U.S.S.R.

Caries-preventive effect of vanadium compounds: an additional study (Weitere Versuche zur Kariesbekämpfung mit Vanadinverbindungen)

Michael Winiker. *Odont.Revy* 8:196-201
July-Dec. 1957

Vanadium, a metallic trace element, is the first member of the subgroup V of the periodic system. It dissolves in nitric acid and can be combined with oxygen by moderate oxidizing agents in acid solutions. The fusion of vanadium with alkalines produces polyvanadates in which the molecular ratio of vanadium pentoxide to the basic oxide is greater than in metavanadates.

In 1956, experiments were carried out at the Dental School of the Humboldt University of Berlin, Germany, to determine whether vanadium compounds could be used to prevent or decrease the incidence of dental caries. The following, previously reported, results were obtained: (1) significant decrease in the incidence of caries, experimentally produced in Syrian golden hamsters; (2) occasional occurrence of chronic intoxication, liver and kidney damage and alteration in the blood (vanadiumism) were caused by high doses of vanadium pentoxide, sodium orthovanadate and other vanadium compounds, and (3) strengthening of the hydroxyapatite of enamel. In this series, 0.035 mg. vanadium in the form of vanadium pentoxide was added to the cariogenic diet (Keyes diet).

In 1957, the serial study was repeated but instead of vanadium pentoxide, "Vanadat," produced by the addition of alkaloids to polyvanadate, was used. Syrian golden hamsters of the same strain were used as experimental animals.

The caries frequency resulting from the various diets was recorded as follows: (1) normal diet, 13.9 per cent; (2) cariogenic diet, 32.4 per cent; (3) cariogenic diet to which 0.01 ppm Vanadat was added, 27.8 per cent; (4) cariogenic diet to which 0.02 ppm Vanadat was added, 38.9 per cent; (5) cariogenic diet to which 0.04 ppm Vanadat was added, 11.5 per cent; (6) cariogenic diet to which 0.08 ppm Vanadat was added, 24.1 per cent, and (7) cariogenic diet to which 0.2 ppm Vanadat was added, 51.1 per cent.

According to these findings, the maximum caries-preventive effect was obtained by adding 0.04 ppm Vanadat to the cariogenic diet. In spite of the comparatively high doses of Vanadat (up to 0.2 ppm) administered, no symptoms of vanadiumism appeared.

The cariogenic diet given contained 3,500 calories and was especially rich in sucrose, dextrose and carbohydrates (rice, oatmeal and potatoes).

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Observations on the dental problem in Chile Chico

(Observaciones sobre el problema dental en Chile Chico)

Elena Skudin Ostrosky. *Odont.chilena*
5:1018-1021 Nov.-Dec. 1956

The magnitude of the dental problem in Chile Chico, a town in the southernmost part of Chile, is intensified by the lack of adequate resources for dental care and an absence both of pathways of communication and of means of transportation. The town is the only medical and dental center in a vast region isolated from the rest of the country by its geographical position. In addition to the population native to the area, it contains within its communal limits a large mining population, divided among various widely separated encampments. At the present time, these encampments can be reached only by navigation on Lake Buenos Aires—a circumstance that makes the provision of continuing and effective care extremely difficult.

The dental and oral problems presented by the general population consist chiefly of: (1) dental

caries and its complications; (2) periodontal diseases; (3) dental anomalies, and (4) in the mining population, occupational saturnism, which, however, is not common.

A study of 206 children aged 6 to 15 years showed that the total DMF index was 613 for 106 children 10 years of age or less (average, 5.7), and 266 for the remaining 100, who were in the 11 to 15 year age group (average, 3.6).

Many factors enter into the production of caries, but those chiefly responsible for the conditions found in the children of Chile Chico are a faulty diet, which consists largely of meat and liquids and is very poor, if not entirely lacking, in salad stuffs, fruit, milk, vegetables and fish, and the inadequate provisions for dental care and health education. The problem cannot be solved by clinical measures, because there is no way to keep up with the ever-increasing amount of work to be done. General measures, such as fluoridation of the drinking water, therefore must be used to reduce the incidence of caries and other dental lesions and to bring them under control. At present, the people of Chile Chico obtain their drinking water in a primitive manner from Lake Buenos Aires, but a system of water works, which is essential for the carrying out of a program of fluoridation, will, it is hoped, soon be provided for the town.

Chile Chico, Chile

Planning and evaluating studies on experimentally produced caries in rats

(Zur Planung und Auswertung tierexperimenteller Kariesstudien)

T. M. Marthaler, H. R. Mühlemann and K. G. König. *Schweiz.Mschr.Zahnhe.* 67:755-776
Sept. 1957

A fundamental requirement for the quantitative and qualitative evaluation of experimentally produced carious lesions in rats and other animals is the determination of the inhibited caries frequency and the differentiation of the severity of the carious lesions. No single caries index, as valuable as it may be for other studies, is satisfactory for adequate appraisal of experimental caries inhibition.

At the Dental Institute of the University of Zurich, Switzerland, the following scoring method has been used successfully in several studies on experimentally produced caries in rats: score A designates the initial carious lesions, score B the medium lesions and score C the severe lesions. The number of A lesions that have occurred while the animals were being fed a cariogenic diet are scored A + B + C. The number of B lesions, appearing after the initial period, are scored B + C. The number of C lesions, however, remain score C.

This scoring method facilitates the separate evaluation of inhibitory actions on the caries initiation and on the progress of caries, which seem to be different processes.

Caries reduction percentages, due to the inhibitors, differ greatly. These differences depend on a calculation on the basis of the reduced A, B and C frequency.

Short-time studies on experimentally produced caries require more sensitive methods for the evaluation of the carious lesions.

The circular saw technic for cutting the jaws and the staining of the segments with Schiff's reagent have obtained the best specimens for research.

In order to make the greatest possible use of small groups of experimental animals, and to rule out statistically the influence of undesirable environmental factors, the design for such studies must follow biostatistical principles and all experiments must be performed under strictly standardized conditions.

The caging of the animals in blocks housing different litters permits the successive experimentation with new litters until the required number of animals necessary for each study object is reached.

Different causes for variations in the susceptibility to caries, such as genetic and sex factors or environmental influences, can be studied separately from the over-all variability observed in random samples and can be evaluated as to their importance.

The "cage factor" influences greatly the susceptibility to caries. It is recommended, therefore, that each animal be housed in a single cage in order to increase the number of test units.

Zürichbergstrasse 4, Zurich, Switzerland

Vitamin B₆ and dental caries

(Vitamin B₆ und Zahnkaries)

Lyon P. Strean. *Schweiz.Mschr.Zahnhk.* 67:981-988 Nov. 1957

The importance of the part the oral bacteria play in the initiation of dental caries cannot be over-emphasized.

In more than 36 articles which have appeared in dental and medical literature, the authors have suggested that in caries-susceptible persons, afflicted with rampant caries, homofermentative microorganisms predominate in the oral cavity. In caries-resistant persons, however, heterofermentative bacteria are more evident.

Homofermentative bacteria ferment glucose to lactic acid. Heterofermentative bacteria ferment glucose and other saccharides to lactic and other organic acids, some of which are volatile and may enter into metabolic processes.

Because homofermentative bacteria do not utilize vitamin B₆ (pyridoxine) and heterofermentative bacteria require this vitamin as an essential nutrient, a study was made to evaluate the effect of pyridoxine as a dietary supplement to decrease the incidence of caries in Syrian hamsters.

The experimental animals received pyridoxine in a concentration of 50 mg. per hundred grams of food ration and showed a twentyfold increase in caries compared with another group (raised under identical conditions) which had received pyridoxine in a concentration of 1,000 mg. per hundred grams of food ration.

Clinical studies, made over a period of several months, with school children receiving a lozenge containing 3 mg. pyridoxine after each meal, indicated that in this group fewer cavities developed than in the control group receiving placebo lozenges.

Administration of pyridoxine as a supplement to the human diet would set up a competitive system within the body in which the heterofermentative bacteria would multiply at the expense of the homofermentative bacteria of which *Lactobacillus acidophilus* is a notable example. Less lactic acid would then be produced in the oral cavity and in dental plaques and thereby the incidence of caries would be reduced.

Vitamin B₆ deficiency is related to various stress phenomena including conditions of strain

experienced in pregnancy. Patients under stress frequently develop an increased susceptibility to caries because many pathogens are able to flourish when not in competition with saprophytic bacteria.

It is suggested that by increasing the daily intake of pyridoxine the incidence of caries can be reduced.

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Dental caries in humans and animals:

a comparison (Die Zahnkaries beim Menschen und Tier: ein Vergleich)

J. Kostlán. *Odont.Revy* 8:240-242 July-Oct. 1957

Dental caries, artificially produced in albino rats, was the main subject of experiments carried out at the Research Institute of the Dental School, University of Prague, Czechoslovakia.

Five consecutive generations of caries-susceptible and caries-resistant strains of albino rats were fed a cariogenic diet consisting mainly of bread, butter, cocoa and eggs (Sognnaes' diet). The amount of monosaccharides was gradually increased.

In the caries-susceptible strains, a great increase in the caries incidence was observed in the second daughter generation. In the caries-resistant strains, a slight increase in the caries incidence occurred in the fourth daughter generation.

Besides the determination and evaluation of the changes in tooth structures caused by experimentally produced caries in rats, the alterations occurring in the internal organs were investigated. It is assumed that a definite relation exists between pathologic changes in the internal organs and the cause of caries.

It was established that feeding a cariogenic diet to successive generations of albino rats causes fatty degeneration in the tissues of the liver, a symptom which appears especially pronounced in the female rats of the second and third generation. In the salivary glands a similar fatty infiltration occurs in the epithelium of the salivary ducts which influences unfavorably the flow of saliva and produces changes in the chemical property of the saliva secreted by the parotid and sublingual glands.

The findings of animal experiments, however, cannot be applied indiscriminately to human beings. A transfer of observations or experiences is permissible only if the physiologic effects and the symptomatology are identical. Such similar conditions seem to exist between the experimentally produced caries in albino rats and the caries in human beings.

The comparison between findings of animal experiments in regard to caries etiology and control with the results of research carried out in human beings may increase the knowledge of the cause, prevention and control of caries, especially in regard to the relation existing between the incidence of caries, certain dietary procedures and the metabolism of dental structures and the whole organism.

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Criteria to consider

when supplementing fluoride-bearing water

David F. Striffler. *Am.J.Pub.Health* 48:29-37 Jan. 1958

When supplementation of a fluoride-bearing community water supply is under consideration, public health officials should weigh the following criteria: (1) the tangible benefits in terms of the anticipated reduction in caries attack rate, the anticipated increase in caries-free incidence, and the anticipated reduction in dental care costs; (2) the tangible costs in capital outlay and annual operating overhead; (3) the intangible benefits, such as fewer toothaches; (4) the priorities to be considered and the intangible costs of a long, hard, time-consuming "fluoridation battle," and (5) the additional problems of climate, prevalence of dental caries, number of children served, competence of waterworks operators to handle the technical complexities of minute adjustments, and the economic status of the community.

From the tables and graphs on DMF experience at various levels of fluoride, rough estimates can be made of the anticipated reduction in the caries attack rate resulting from the enrichment of fluoride-bearing waters to the optimum level.

The responsibility of the public health official

is to weigh the pertinent criteria and, together with the community officials, reach a reasonable conclusion as to whether or not supplementation is advisable.

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Caries in Indians of the Mexican Cordillera, the Peruvian Andes and at the Amazon headwaters

H. H. Neumann and N. A. DiSalvo. *Brit.D.J.* 104:13-16 Jan. 7, 1958

A dental and dietary survey was made among contemporary Indians of the tribes of Otomi, Zapotec and Chamula Indians in Mexico, the Mayan Indians in Guatemala, the Shipibo in the Upper Amazon basin, and the Quechua and Aymara in the Peruvian Andes. The findings were as follows:

1. The decay rate encountered was generally low, with an over-all average DMF rate of about one for male adults.
2. Racial or climatic factors seemed unimportant, as the apparent immunity to caries was lost wherever and whenever individuals adopted modern eating habits. The absence of caries in these tribes therefore can be attributed to dietetic factors.
3. Two factors may account for the extreme difference in dental conditions found with primitive and civilized diets, namely, a destructive agent in "refined" food, and a protective agent in "natural" food.
4. The diets of some tribes were poorly balanced and deficient in nutritional essentials, low in proteins and fats and high in carbohydrates, in some areas also in simple, readily fermentable sugars.
5. Wherever good teeth prevailed, some eating habits were encountered that frequently provided the teeth with heavy loads, even though the bulk of the diet might be soft or liquid.
6. Although most of the Indians were of short stature, slim, with asthenic physique, their biting force as measured with the gnathodynamometer exceeded by far the average encountered among athletes in the United States.
7. Because of the vast differences in the chem-

ical composition of the diets of widely scattered primitive groups with good teeth, including well-balanced or deficient high protein or high carbohydrate diets, and because the diets generally contain some substances that place a greater load on the teeth than do "refined" diets, it is suggested that the protective factor in "natural" diets may be a biophysical rather than a biochemical one.

8. Both crystalline substances and organic tissues are highly sensitive to the range of transmitted pressures. To explain the caries resistance found with "natural" diets it is suggested that the greater chewing loads may influence reversibly molecular structure and ionic exchange in the teeth, affecting their immunity to the attacking agents in the mouth.

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Survey of dental conditions in the nursing homes in Fulton County

John E. Chrietzberg, Fred D. Lewis and James B. Carroll. *J.Georgia D.A.* 31:15-19 Jan. 1958

Representatives of the Dental Health Service of the Georgia Department of Public Health and the dental division of the Fulton County Health Department visited 26 nursing homes in Fulton County and made a dental survey of 855 patients ranging in age from 23 to over 99 years. Of the 284 men and 571 women examined, 235 were nonambulatory. Only 18.5 per cent of the patients had received dental care within the past five years.

Of 289 patients having one or more natural teeth present, 119 required periodontal treatment; 203 teeth needed filling, and 1,404 teeth needed extracting. Extraction would do more to clear up existing oral infection in these patients than almost any other treatment. It was estimated that 511 new dentures were required, and that 363 existing dentures needed replacement or repair.

Because of the present conditions in the homes, it would be difficult to set up a comprehensive dental program. A program could be developed, however, to treat oral infection and

to repair broken dentures while a program is being developed for more adequate dental treatment.

Few patients received well-rounded or appetizing diets. Large numbers of patients sit around waiting for time to pass. Approximately 90 per cent of them are over 60 years old.

A community center under one central administration is indicated for these people, a center to be supported by federal, state and local agencies. Such a center should provide comfortable quarters, occupational therapy, religious help, recreational facilities, medical, dental and nursing services, and other services that will help these aging, unfortunate people find comfort and peace in their remaining years.

A few of the nursing homes provided adequate dental services for the patients. Two of the larger homes had dental clinics and a few of the other homes had arranged with private dentists to provide emergency dental service.

Department of Public Health, State of Georgia, Atlanta, Ga.

Pyridoxine supplementation in the suppression of dental caries

Abram Cohen and Carl Rubin.

Bul.Philadelphia Co.D.Soc. 22:84-86 Jan. 1958

The effect of pyridoxine in suppressing dental caries was studied in a double blind test involving 345 children between the ages of 11 and 14 years. After the DMF rating had been established for each child, the children were divided into two similar groups according to age and sex. Test lozenges and placebos were distributed twice daily, morning and afternoon, in the school. A third lozenge was given to the pupil to be taken after the third meal. On Friday afternoon a sufficient quantity was given to the pupil for home consumption over the weekend. The test lozenge contained 3 mg. pyridoxine and was anise-flavored. The placebo lozenge had the same flavoring but did not contain pyridoxine. Neither the dentist, teacher, child or parents knew whether a specific child received a placebo or a lozenge containing pyridoxine.

After eight months the children of one of the two schools were re-examined. Those receiving

the placebo lozenges showed an increase of 26 per cent in the DMF rating as compared to the children receiving pyridoxine. When the chi-square test is applied, the significance of the difference does not quite reach the customary 5 per cent level; however, the results appear suggestive.

The study continued another four months, after which the teeth of the participants were again examined. The group receiving placebo lozenges showed a DMF rating about 11 per cent higher than the group receiving the lozenges containing pyridoxine.

The study will continue for several years.

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The role of the dental health educator, trained in dental hygiene, in a state dental health program

Lucile Mullinix Bowman. *J.Tennessee D.A.*

38:26-33 Jan. 1958

Responses to a questionnaire on dental health education, sent to the dental directors of 44 states and 3 territories having dental divisions are summarized. The main objective of the study was to determine the duties and functions of a dental health educator trained in dental hygiene in a state dental program. All but seven of the states responded. The following activities and duties were defined:

1. The dental health educator should maintain good professional relations with dentists and other dental hygienists of the state, and attend the meetings of the professional associations.

2. Emphasis should be placed on planning dental health programs with school personnel and teachers.

3. The most effective group activities listed were those of the Parent-Teacher Association, civic groups, dental hygiene schools and teacher colleges.

4. Respondents stressed the need to evaluate present dental health materials and to develop new pamphlets or guide materials for teachers and other interested persons. Mass distribution of materials without personal contact is a poor method of teaching dental health.

5. Communities should be assisted in planning

dental health programs. Planning should be related to existing needs and availability of resources.

6. The direct service given by the dental health educator should be restricted to demonstration to local personnel. Additional services would be instruction in the home care of the mouth and in the management of a low carbohydrate diet for the control of tooth decay.

7. The dental health educator should work most closely with nurses, nutritionists and health educators on the state level to plan programs.

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Dental public health at the federal level

Norman F. Gerrie. *Pennsylvania D.J.* 24:2-7 Dec. 1957

Federal responsibility for dental public health activities rests mainly in the Department of Health, Education, and Welfare, particularly in the Public Health Service and the Children's Bureau. The latter two agencies provide technical assistance and financial support to state and local health agencies. The Children's Bureau has primary interest in the dental health of mothers and children. The bulk of federal funds for state dental program support comes from the Bureau's Maternal and Child Health grant sources, and direct consultation is provided to the states and communities.

The Public Health Service is concerned with the dental problems of the total population. It provides services through its decentralized dental staffs in regional offices in close touch with the state and local health departments. It conducts programs in basic and socioeconomic research, and engages in the development and improvement of technical procedures, facilities and methods for preventing and controlling dental diseases. The scope of the federal role in dental health is determined by Congress.

The federal government carries out its dental health responsibilities through a three-step procedure:

1. It defines the problem.
2. It develops and improves technical procedures for controlling the problem.
3. It seeks to attain widespread use of the technical procedures, facilities and methods developed.

Federal interest in dental research is focused on filling gaps in the knowledge of the cause, diagnosis and treatment of dental diseases. New knowledge produced by research commonly requires development, refinement and large-scale testing before it is adaptable to the needs of the population. This process of development is carried out by pilot projects and field trials. Two examples of pilot projects of this kind were conducted by the Public Health Service in the fluoridation and defluoridation of public water supplies.

Methods for increasing the productivity of dentists through effective use of trained auxiliary workers have been developed through the community dental care studies at Richmond, Ind., and Woonsocket, R.I. Other instances of developmental activities are the dental care studies of institutionalized and homebound chronically ill and aged patients, pilot projects on improved methods of fluoridating public water supplies, and investigations of indexes for measuring periodontal disease.

Regional dental consultants of the Public Health Service work closely with the states in their areas to assist in state and local program content and operation. All the state and territorial health departments of the United States employ only about 140 dentists. Specific procedures have been developed for preparing state dental programs.

One of the most valuable contributions to community dental health made possible by federal grants is the training of dental personnel. Maternal and Child Health grant funds are expended by the states each year for the postgraduate training of private dentists in courses on pedodontics.

Division of Dental Public Health, Department of Health, Education, and Welfare, Washington, D.C.

Pathology

Diseases of the temporomandibular joint (Die Erkrankungen des Kiefergelenkes)

E. Reichenbach and F. Bräse.

Deut.Zahnärzte Kal. 16:26-43, 1957

Severe periodic headaches, often unilateral, paroxysmal pain involving the geniculate ganglion and the facial nerve, disturbances in hearing and burning sensations in tongue and oral mucosa constitute the syndrome which indicates the presence of diseases in the temporomandibular joint.

These diseases can be diagnosed best by interpretation of roentgenograms that have been taken by Parma's, Schüller's, Hausser's or Clementschitsch's methods.

Diseases of the temporomandibular joint can be classified as follows: (1) disturbance of the joint; (2) infection in the region of the temporomandibular articulation; (3) dislocation of the

articulation; (4) true (permanent) ankylosis; (5) false (temporary) ankylosis; (6) trismus; (7) closure of the jaws caused by psychoneurosis, and (8) pathologic changes in the muscles of mastication.

Patients frequently seek relief for headaches, facial pain, deafness or dizziness, rather than treatment of (unsuspected) disease or disturbance of the temporomandibular joint. It is essential that dental practitioners are aware of this syndrome and of the indication of a disease which has affected the facial nerves and the entire central nervous system. Patients usually are able to localize the main site of pain even though the topology of the temporomandibular joint is unknown to them.

A comparatively frequent occurrence is arthropathy which Axhausen has differentiated in chondral and osseous types. Costen's syndrome, consisting of dysfunction of the joint, mandibular overclosure and displacement, crackling sound during jaw movements, severe pain and friction on nerves and vessels, indicates the presence of temporomandibular arthropathy.

Roentgenographic (teleroentgenographic) examination will reveal all the transitions which have taken place in the temporomandibular articulation. Abnormalities in function such as diffi-



Rheumatoid arthritis of the temporomandibular joint



Elastically fixed true dislocation of the joint (Wassmund's classification)



Roentgenogram taken by Parma's technic

culty with articulation, defects in occlusion and inadequate masticatory function are the symptoms of the chondral type of arthropathy; inflammatory destruction or pathologic alteration of tissue produced by disharmony in the dentition are the signs of the osseous type (Axhausen).

In treatment, the use of the functional-orthodontic appliances developed by Andresen-Häupl obtains favorable results.

According to Wassmund, dislocations of the temporomandibular joint can be classified as follows: (1) elastically fixed true dislocation, and (2) chronic subluxation (habitual dislocation).

For treatment of dislocations of the joint, Parma's method of roentgenotherapy is recommended. Surgical treatment methods should be considered only when roentgenotherapy has failed. Various treatment methods have been introduced by Conjetzny, Wassmund, Lindemann, Nieden, Rehrmann, and others, to promote instant relief in disturbances of the joint. In most of these methods, orthodontic or prosthetic appliances are used, and pressure pads are kept in position for several months by firm stainless steel springs passing over the calvaria. Wiring the jaws in occlusion and keeping them immobilized for six months also has been recommended by many authors. In some instances, altering the occlusion has obtained favorable results.

Infection of the condyles can be acute or chronic. In the acute form, the symptoms are pain, tenderness, swelling and limitation of jaw movements. Suppuration may follow, usually accompanied by high temperature, edema, redness and increasing pain. In the chronic form, the symptoms are shooting pain in the upper teeth, radiating facial neuralgia, soreness and pain localized in the condylar region. There also may be some tightening of the joint accompanied by crackling sounds. The course of the chronic type is comparatively slow because usually ankylosis of the joint is present also.

In the acute form of infected condyles, treatment consists of absolute rest, application of moist and hot compresses soaked in magnesium sulfate, and physiotherapy. Oral infections should be eliminated and the mouth should be opened with a trismus apparatus or surgically under general anesthesia.

Exostosis of the zygomatic arch and severe

ossification of pterygoid ligaments usually require the formation of an artificial joint. Also in hypertrophy of the condyles, excision and replacement of the joint is indicated.

In almost all instances of diseases of the temporomandibular joint, the diagnosis is made best by a process of elimination. The more common causative factors should be considered first in the following order: (1) inflammatory infiltration of tissues; (2) dental focal infection or chronic sepsis; (3) trauma; (4) mumps; (5) arthritis; (6) mechanical impediment caused by benign or malignant growths; (7) mechanical impediment caused by scar formation; (8) hypertrophy of the condyle, and (9) exostosis of the zygomatic arch or ossification of the pterygoid ligaments.

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Anaerobic infection of the tongue: report of case

(Sluchai anaerobnoi infektsii iazyka)

K. I. Myshkin. *Vestnik Chir., Moscow*
79:8:112 Aug. 1957

Microorganisms causing anaerobic infection are found on the skin and in the oral cavity. A case involving anaerobic infection of the tongue is reported from the faculty of the Medical Institute of Saratov.

A 45 year old man had bitten his tongue accidentally while speaking. Within seven hours the tongue became painful and swollen. The patient's temperature rose to 40° C. (104° F.) and his breathing was obstructed. He entered the clinic in a grave condition. Though his mind was clear and he could answer questions, his speech was hardly comprehensible. His mouth was half open, as the swollen tongue occupied the oral cavity. The tongue was dark-pink with an appearance of boiled meat toward the edges. The tip was black. Edema was extending rapidly into the neck and submandibular region. The oral mucous membranes appeared bluish and acrocyanosis was present. The pulse was 120 per minute and the blood pressure was 90/70.

Because of this alarming clinical picture, anaerobic infection was suspected. Under local anes-

thesia incisions were made through the tongue, the frontal surface of the neck and the submandibular region. There was minimal bleeding from the neck and no bleeding from the tongue. Antitoxins and large doses of penicillin were administered. Camphor and caffeine were injected subcutaneously and venous transfusions of blood, physiologic saline solution and 5 per cent glucose were given. The wounds were bathed with hydrogen peroxide.

Seemingly, the patient's condition improved momentarily. After 30 minutes it worsened rapidly, with increased symptoms of intoxication, a blood pressure of 60/40, a pulse rate of 58. Forty hours after entering the clinic, the patient died.

The findings at autopsy suggested anaerobic sepsis. Histologic examination of the tongue revealed necrosis of the epithelium, edema of the muscles and a high infiltration of leukocytes with occasional erythrocytes. A culture medium for sections of the tongue grew *Clostridium welchii*.

This was a rare instance of anaerobic infection. There has not been another report of such a case in the literature.

Medical Institute of Saratov, Saratov, U.S.S.R.

Adenoma sebaceum associated with tuberous sclerosis: report of case

(Przypadek choroby Pringla, zespół Bourneville'a)

Irena Klemczynska-Michalska. *Czas.stomat.* 10:617-620 Oct. 1957

Adenoma sebaceum (Pringle's disease) occurring in the oral cavity and associated with tuberous sclerosis (Bourneville's disease) is seldom mentioned in the textbooks on pathology of oral and dental diseases.

This syndrome consists of nodular sclerosis of the cerebral cortex, epileptic attacks, mental deficiency and tumors in the oral cavity and in various parts of the body.

A 19 year old girl was observed at the Clinic for Oral Surgery of the University of Warsaw, Poland. Besides the previously diagnosed syndrome of tuberous sclerosis, a neoplasm was observed on the oral mucosa of the inner left cheek, consisting of sebaceous gland tissue and forming multiple

papules of a reddish-yellow color. All blood vessels on the left side of the oral cavity were involved in the neoplastic growth, affecting the maxillary sinus and the fundus oculi. Incomplete formation of the glandular ducts prevented normal secretion from the parotid, submaxillary and sublingual glands. The tumor was completely encapsulated, slowly growing and of firm consistency.

Thorough extirpation of the tumor, followed by cauterization with zinc chloride, was indicated, particularly on account of the possibility of malignant change. Recovery was uneventful.

Oczki 6, Warsaw, Poland

Inferior alveolar nerve traversing the roots of a third molar (Molar de minte traversat de nervul dentar inferior)

S. Stănescu and H. Kahane. *Stomat., Bucharest* 3:271-274 Sept. 1957

Although instances in which the inferior alveolar nerve traverses the roots of a third molar rarely are observed in dental practice, such occurrences have been reported in dental literature and, therefore, before extraction of a third molar is attempted, this possibility should be considered.

In 1920, Rodie published 16 case reports on inferior alveolar nerves traversing the roots of third molars.

In 1939, Balogh described an extraction of a third molar that was complicated by the abnormal course of the inferior alveolar nerve which passed through the roots.

Puig reported that in 4 of 27 patients, the roots of third molars were traversed by the nerve. In the other 23, the roots were only encircled by the nerve or its branches.

Puig and Ginested studied the topography of the inferior alveolar nerve and established that a relation exists between the course of the nerve and the roots of lower molars which may result in serious complications during or after tooth extractions.

In 1938, Prelipceanu described an instance in which there was severe laceration of the inferior alveolar nerve which had penetrated the roots of

a lower third molar. The topography of the nerve had not been established prior to tooth extraction.

Recently, a 40 year old woman came for periodic examination to the dental clinic of the University of Bucharest, Romania. Deep necrotic carious lesions were observed on her right lower third molar which had led to paresthesia in the right side of the lower lip. Roentgenographic examination revealed that the mesial root of the third molar was abnormally short and its last third was deflected about 90 degrees. The roentgenogram also showed that the course of the inferior alveolar nerve was changed and that branches of the nerve had permeated the root. The patient was referred to the oral surgery clinic where the tooth was extracted by sectioning. Two weeks after surgery, the paresthesia disappeared.

It cannot be established in all roentgenograms, however, whether the inferior alveolar nerve has penetrated the third molar or its roots. In the majority of instances, this can be determined only during the surgical intervention.

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Angular stomatitis

Brit.M.J. No. 5051:1007 Oct. 26, 1957

Q.—A young woman developed fissures at the angles of her mouth during a recent pregnancy. These have persisted despite treatment with vitamin preparations and an ointment containing neomycin and hydrocortisone. Her teeth are healthy. What is the etiology and treatment of the condition?

A.—Fissures at the angle of the mouth (angular stomatitis) are often evidence of nutritional deficiency, especially in pregnancy. They may be associated with an iron deficiency, anemia and achlorhydria or lack of one of the components of the vitamin-B complex, notably riboflavin. Sometimes the etiology is obscure and there is no valid explanation for their presence. A full blood count and test meal should be included in the investigation. Although in the instance described vitamin preparations have not proved helpful, it is possible that their potency has not been sufficient. It is suggested that two tablets consisting of the fol-

lowing ingredients be given twice a day: thiamine hydrochloride, 5 mg.; riboflavin, 2 mg.; nicotinamide, 20 mg., and pyridoxine hydrochloride, 2 mg.

British Medical Association, Tavistock Square, London, W.C.1, England

Nematode infestation of the buccal submucosa

Dan Y. Burrill, Emil Kotcher
and James K. Childers. *Oral Surg., Oral Med.*
& *Oral Path.* 10:612-613 June 1957

A patient in the clinic of the University of Louisville School of Dentistry called the attention of the student who was carrying out routine dental treatment to what apparently was a worm under the mucous membrane of the lower right buccal sulcus of the patient. The worm moved perceptibly. After anesthesia was obtained by block injection, a shallow incision was made parallel to and alongside the worm and it was gently teased out of the tissues. It was alive and was about two inches long and about 0.3 mm. or less in diameter. Examination revealed it to be a female nematode with undeveloped ova in the uterus. The specimen was submitted to the U.S. Department of Agriculture agricultural research service, which identified it as *Gongylonema pulchrum*.

The patient was born and reared on a farm in Hart County, Kentucky. Drinking water was obtained from a spring-fed stream. The patient reported that she had suffered recurrent ulcers of the mouth for the past five years; they have continued since the worm was removed. In recent years she had had pneumonia three times and had had pleurisy and felt increasingly "run down." Since removal of the worm the patient has been feeling well except for occasional headaches and recurrent ulcerations in the mouth.

It is not clear that the many symptoms reported by the patient are attributable to the parasite.

Nematodes of the genus *Gongylonema* are found primarily in the submucous tissues of the upper portion of the digestive tract in such animals as the horse, ox and pig. Eggs are evacuated in the feces of the host and lie dormant until

eaten by an insect, such as a dung beetle or cockroach. Thence the organisms find their way back into the digestive tract of the mammalian host where the larvae probably pass into the wall of the stomach or intestine and migrate through the tissues of the wall of the organs to the esophagus or oral cavity. Only a few other instances of human infestation by this parasite have been reported.

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Agranulocytosis: etiology and treatment

(Ein Beitrag zum Krankheitsbild der Agranulocytose)

F. Müller. *Deut. zahnärztl. Zschr.* 12:1164-1171 Sept. 1, 1957

Agranulocytosis is an acute febrile disease which occurs more frequently in women than in men. Although the exact cause is not definitely known, recent research has established that the reaction of the human organism to drugs of the amidopyrine series, barbiturates, sulfonamides, neosphenamines and gold preparations and the sensitivity to certain toxic agents may result in agranulocytosis. Recently there has been a considerable increase in the use of these drugs, and consequently a significant increase in the incidence of agranulocytosis. In isolated instances, this disease has occurred after a patient has received penicillin therapy.

A considerable reduction in number of granulocytes and myelocytes in the blood is characteristic of the disease. The formation of an excessive amount of leukocytes is serious. Far more serious, however, is the sudden drop from 7,500 per cubic centimeter to 140 or even less which occurs in agranulocytosis because these white blood cells form the main line of defense against infection. Necrotic lesions of the gingival tissue appear in regions bordering the sulcus. The invading microorganisms act quickly because of the lack of

phagocytic granulocytes. Infections spread toward the gingiva and later affect the periodontal membrane and the marrow of the alveolar process. During this course, the supporting tissues of the teeth are destroyed.

At the dental clinic of the University of Bonn, Germany, middle-aged women with agranulocytosis were examined.

The following five clinical types could be differentiated: (1) an acute form with an almost 100 per cent mortality rate; (2) a subacute form lasting from one to three weeks until proper treatment obtains cure; (3) a recurrent form with a mortality rate of about 50 per cent; (4) a subchronic form with a comparatively favorable prognosis, and (5) a cyclic form with either chronic or periodic attacks (sudden onset and quickly rising temperature) which has a mortality rate of from 50 to 80 per cent.

These figures were recorded after the introduction of treatment with sodium salts of pentose nucleotides (Pentnucleotide). Prior to this treatment method, the mortality rate of all five types of agranulocytosis was almost 100 per cent.

Treatment consisted of intramuscular injections of an 8 per cent solution of Pentnucleotide (0.7 Gm. twice daily) until the leukocytic count began to rise. After that, one daily injection was sufficient to bring the count to normal. Stimulating doses of roentgen rays have been of assistance in treatment of the subacute, recurrent and subchronic types. Frequent blood transfusions increased the survival rate in the initial, critical week. Administering of drugs determined or suspected of being causative factors was discontinued.

In several patients with agranulocytosis, ulcerations also have been found in the tonsils, the pharynx, the gastrointestinal tract and the vagina. These organs are lined with mucous membranes harboring pathogenic microorganisms which produce necrotic lesions similar to those occurring in the gingivae.

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Face mask for edentulous patients, showing the rubber flanges attached to the inner portions of the face cushion

Anesthesia
and analgesia

Mask for edentulous patients

Frederick Tesher and Martin Helrich.
Anesthesiology 19:90 Jan.-Feb. 1958

The administration of inhalation anesthesia to edentulous patients often presents a difficult problem. These patients have experienced a loss of vertical dimension of the face which makes it difficult, and sometimes impossible, to obtain a gas-tight fit with a face mask. The resorption of the alveolar process has resulted in a shrinkage of the corners of the mouth, which adds to the difficulty.

Various measures have been instituted to overcome this problem. Some operators pack both of the patient's cheeks with moist gauze to round out the facial contour. Others induce anesthesia with the patient's dentures in place. Both of these techniques create the hazard of obstructing the airway with a foreign body. Other techniques include the use of a large, doughnut-shaped mask with an inflatable cushion, and the introduction of an endotracheal airway.

Rubber flanges have been vulcanized onto the inner portions of the lip of a standard anatomical face mask. The flanges allow an adequate fit by increasing the longitudinal dimension of the face and filling out the corners of the mouth. The mask is readily placed in the patient's mouth and brought into contact with the face. The flanges tend to raise sunken cheeks and to keep the jaws slightly separated, thus increasing the vertical dimension of the face.

The face mask has been used to induce anesthesia in more than 100 edentulous patients, with complete success.

The experimental model of the mask was produced by Felix Weinberg, Baltimore, Md.

U.S. Navy, Bainbridge, Md.

Dangers of nitrous oxide

Editorial. *Brit. M.J.* No. 5056:1293-1294
Nov. 30, 1957

It is refreshing to find that the widespread practice of administering nitrous oxide for the extraction of teeth has come under critical review. Bourne has circularized a random sample of 386 dentists with a questionnaire whose main question was: "Have you ever known a patient who did not immediately regain consciousness after gas but remained unconscious or stuporous for half an hour or more?" As a result of the answers obtained, he estimated that at least 15,000 in-

stances of this sort had been seen in the life and experience of practicing dentists, and that such instances occur in dental practice in Great Britain at the rate of 500 a year. F. F. Cartwright has pointed out that, on the basis of Bourne's figures (14 deaths in 30 months), the mortality due to nitrous oxide would be about 1 in 226,000.

Nitrous oxide is certain to continue in use for some time; at least two precautions, emphasized by Bourne, have to be taken with it:

1. The oxygen content must be high enough to avoid any possibility of anoxia, even when given to a patient in the vertical position of the dental chair. Nitrous oxide with oxygen in a concentration of about 20 per cent usually produces adequate analgesia for dental extraction in a relaxed pink patient in many instances.

2. When possible, the patient should be horizontal rather than vertical. This is a matter on which dental opinion no doubt will be divided.

An additional safeguard is adequate training and skill on the part of the administrator. No amount of oxygen in the mixture can prevent anoxia due to respiratory obstruction, nor can the horizontal posture prevent asphyxia due to the inhalation of blood. When nitrous oxide is compared to more potent anesthetics such as cyclopropane and halothane, it is noted that with the latter two vapors dangerously high concentrations may be inhaled, and the patient brought near to death without a warning sign as noticeable as cyanosis—a sign which probably accounts more than anything else for the safety of nitrous oxide.

British Medical Association, Tavistock Square, London, W.C.1, England

Manual versus mouth-to-mouth methods of artificial respiration

Peter Safar and James Elam. *Anesthesiology* 19:111-112 Jan.-Feb. 1958

Five methods of artificial respiration were studied in controlled experiments on 25 unconscious adult volunteers and patients who were paralyzed with succinylcholine without tracheal intubation. The methods were: back-pressure arm-lift (Holger Nielsen), chest-pressure arm-lift (Silvester), chest-pressure (supine), mouth-to-mouth and

mouth-to-airway. Tidal volumes were recorded with a spirometer during performance of the manual methods and with a volumetrically calibrated pneumograph during performance of the mouth-to-mouth methods. Experts in artificial respiration performed the manual methods. One hundred and sixty-seven untrained personnel, mostly laymen, performed the mouth-to-mouth methods after a brief demonstration.

The average tidal volume produced by the currently recommended back-pressure arm-lift method in 15 "victims" was 131 ml. In 12 of the 15 "victims" all tidal volumes were smaller than the estimated respiratory dead space. Insertion of an oropharyngeal airway did not improve the tidal exchange. When a second operator held the "victim's" head in extension, the tidal exchange was slightly improved in some instances. The other manual methods moved equally small tidal volumes. The frequent failure of the manual methods is due to obstruction of the pharynx and a pressure gradient too low to move adequate volumes of air into the lungs of obese or "stiff" victims.

Obstruction of the pharynx occurred in 45 deeply anesthetized patients whose necks were flexed, even when an artificial oropharyngeal airway was in place. This obstruction occurred in supine as well as in prone positions. In five "victims" the back-pressure arm-lift method was studied, without and with an endotracheal tube in place; no ventilation was produced in four of the five "victims" without the endotracheal tube, whereas adequate tidal volumes were moved in all five "victims" with the endotracheal tube.

With the mouth-to-mouth and the mouth-to-airway methods, tidal volumes of 1,000 to 2,000 ml. were moved in all 15 "victims." Even small women and Boy Scouts could ventilate adequately "victims" weighing up to 210 pounds. The oxygen saturation remained above control levels and the end-respiratory carbon dioxide concentration below control levels with tidal volumes of at least a liter, at rates of at least 10 per minute. This exchange was maintained by the same rescuer for periods of up to 30 minutes. Re-oxygenation of hypoxic "victims" was accomplished by five mouth-to-mouth inflations within a few seconds.

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Periodontics

**A study
of the etiology of pregnancy gingivitis
with special reference to hormonal
and dietary influences**

Irwin Lighterman and Stanley Lees.
J. Japan Stomat. Soc. 24:103-117 June 1957

After reviewing the literature on pregnancy gingivitis, the authors reach the following conclusions:

The work of Ziskin and his co-workers provides strong evidence that the gingival changes characteristic of pregnancy gingivitis may be attributed to the available estrogen. They show that much of the estrogen is inactivated by a protein linkage. In addition, certain hormones and dietary constituents are antagonistic to the estrogen, inactivating it. The result is an altered estrogen present in insufficient quantities to completely overshadow the inhibitory factors. This theory, however, is too limited in scope to be complete.

Alteration of function of one gland will cause alteration of function to a greater or lesser degree of the glands in the entire endocrine system. Abnormal vitamin and hormone relations are intensified or modified by other vitamins and hormones. Thus, with the altered metabolism of pregnancy, there follows an alteration of function in the entire system. Inasmuch as the tissues are affected to some degree by all vitamins and hormones, the etiologic factors of pregnancy gingivitis cannot be attributed to individual hormones such as progesterone, chorionic gonadotropin, and so forth, and to vitamins such as vitamin A, B complex, and so forth, but rather result from the complex interaction of all vitamins and hormones with periodontal irritation, which may or may not be clinically present, acting as a secondary factor. Irritation is a secondary factor because many individuals with pregnancy gingivitis have no observable irritation, and others who are pregnant, with periodontal irritation, show no signs of the condition.

Other etiologic factors include alteration of endocrine function, increased dietary demands of the body, a complex interaction of diet and hormones, periodontal irritation and neglected oral hygiene, all acting directly on the patient and being counteracted by the patient's resistance.

The nongravid woman will enjoy apparent gingival health because her body's resistance exceeds the adverse factors; suddenly she may find that, with the appearance of pregnancy, new factors arise to overshadow her resistance. When the balance between gingival disease and gingival resistance becomes dangerously close to being upset, the nongravid patient may complain of "bleeding gums" at the time of her menstrual period. This phenomenon may be attributed to increased progesterone production by the corpus luteum; this progesterone, which acts antagonistically to estrogen, thus upsets the "balance of power" periodically in the nongravid patient.

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Tissue reaction to gingivectomy pack

Jens Waerhaug and Harald Loe. *Oral Surg., Oral Med. & Oral Path.* 10:923-937
Sept. 1957

To discover the tissue reaction to gingivectomy packs, an experiment was undertaken involving 28 premolars with 56 buccal and lingual pockets in four dogs seven to nine months ago. The gingivae were cut away at the bottom of the clinical pockets all around each tooth. The bleeding was allowed to stop and a surgical pack was applied. The pack consisted of powder (zinc oxide, powdered pine resin, talc and asbestos) and liquid (isopropyl alcohol 10 per cent, clove oil, pine resin, pine oil, peanut oil, camphor and coloring material). The gingivectomy pack was fixed in acrylic splints fastened to the teeth with amalgam fillings. The packs were kept on for periods of from 9 to 26 days, after which the dogs were sacrificed and the histologic reactions studied. The following conclusions were reached:

1. During a gingivectomy carried out at the bottom of the clinical pocket, the entire "epithelial attachment" will most likely be removed.
2. The gingivectomy pack is slightly irritating, but it does not prevent healing and apparently it

does not cause any damage. It is walled off by a homogenized necrotic membrane of varying thickness. The antiseptics of the pack may penetrate this membrane and prevent or retard bacterial growth. Or, the chemical compounds may be so diluted that they cause little irritation to the soft tissue.

3. The wound surface usually is epithelized within nine days, although some areas may remain uncovered after 23 days. The superficial layer of the epithelium may be subjected to keratinization or parakeratosis, and may be pressed against the pack. In other places exudate may be formed and may discharge between the pack and the keratinized layer.

4. After epithelization, the epithelium most likely will join the tooth surface in the form of a line rather than as a cuff. This condition is not favorable, as a bacterial plaque will be formed on the tooth surface above the gingival margin when the pack is removed. A proliferation upward of soft tissue will ensue, and this will be lying in contact with the bacterial plaque.

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An histological investigation into the keratinisation found in human gingiva

J. R. Trott. *Brit.D.J.* 103:421-427 Dec. 17, 1957

One hundred and forty gingival specimens from males and females of all ages were studied histologically, and the degree of keratinization classified according to Castenfelt (1952).

No evidence of keratinization in the crevicular epithelium of any of the specimens could be found. As to the gingival crest epithelium, non-keratinization was seen in 60 per cent and parakeratosis in 30 per cent. Keratinization of the surface of the marginal epithelium was seen in about 50 per cent of the specimens. A lesser degree of keratinization was found on the surface of the marginal epithelium in women past the menopause. No relation could be found between the variations in the degree of keratinization of the gingiva and the phases of the menstrual cycle.

Ideally, the keratin layer should be a continuous structure on to the tooth enamel without a crevice or break in the continuity. This, however, occurs infrequently in modern man, so that the epithelial attachment is separated from the tooth and this epithelium then becomes the lining to the gingival crevice. That the crevicular epithelium is an inefficient barrier to infection is suggested by the frequency with which leukocytes may be observed infiltrating the epithelium.

Although one can assume that a fully keratinized gingival crest is an ideal, in modern man the crest is more likely to be damaged severely. The mobility of the crest allows it to move away from the tooth so that food passing over the greater convexity of the tooth, instead of going directly onto the keratinized marginal gingiva, impinges on the crest, thus causing damage. Although it could be argued that increased function should increase the degree of keratinization, with the formation of a gingival crevice and therefore a free marginal gingiva, mastication may cause trauma rather than physiological stimulation of the outer epithelial layers. This may be why non-keratinization and parakeratosis so often are found on the crest of the gingival epithelium.

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Pregnancy gingivitis (Gingivitis gravidarum)

J. Roháčková and B. Tichá. *Českoslov.stomat.* 57:50-57 Feb. 1957

In 1877, Pinard reported that he had observed oral disturbances of a specific type in pregnant women. They were characterized by pathologic changes in gingival tissues, hemorrhage, hypertrophy of interdental papillae, severe inflammation and, occasionally, tumorlike formations.

At the Dental Clinic of the University of Brno, Czechoslovakia, 187 pregnant women were examined in 1956. In about 80 per cent, temporary genuine hypertrophy of the gingivae was observed, accompanied by rapidly progressing dental caries and exacerbation of decomposed parts of the soft tissues, periosteum and bones. It was established that pregnancy gingivitis usually begins in the second or third month of pregnancy and may last during the entire period,

sometimes not receding until several months after delivery. In several instances of pregnancy gingivitis, fungoid growths of the papillae were observed.

In the control group, consisting of nonpregnant women, different types of gingivitis, although with symptoms less severe than those of pregnancy gingivitis, occurred in only 25 per cent.

In 1.8 per cent of patients with pregnancy gingivitis, "pregnancy tumors" were observed. These usually benign neoplasms did not regress after parturition and, therefore, were surgically removed.

Pregnancy tumors are vascular and fibrous tissue lesions which sometimes are histologically indistinguishable from granuloma pyogenicum or ulcerated hemangioma.

The cause of pregnancy gingivitis is related to a disturbed function of certain endocrine glands. In isolated instances, this disease is due to drug, chemical or food allergy.

There are indications that the administration of calcium salts and comparatively high doses of vitamins is beneficial.

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**Effects of placental extract
in the treatment of periodontal disease**
(Objektive Erfassung der Wirkung einer internen
Paradontaltherapie mit "Biostimulin-Berna")

Carin Fehr and Hans R. Mühlemann
Paradontol., Zürich 10:152-167 Dec. 1956

At the Dental Institute of the University of Zurich, Switzerland, the effects of a placental extract (Biostimulin-Berna) in the treatment of

periodontal disease were studied. This extract is prepared from human placentas according to a method described by V. P. Filatov.

Twenty-seven patients were in the experimental group, and 11 patients were in the control group.

Records were obtained with the PMA index, color photography and tooth-mobility measurements. Data were recorded before treatment, one month after customary removal of local irritants and from two to three months after treatment with the placental extract.

Local treatment alone reduced the severity of gingival and periodontal inflammations in both the experimental and the control groups, as evidenced by the PMA index and color photography.

Tooth mobility in the control group was reduced by about 20 per cent with local treatment alone within approximately four months.

A total dose of 7.4 ± 0.5 Gm. of placental extract was injected in an average of 14.7 ± 0.9 injections per patient. After 72 ± 5 days, a reduction in tooth mobility similar to that occurring in the control group was observed.

A short time after treatment with the placental extract the patients in the experimental group reported a decrease in the subjective symptoms, and also a feeling of improved general health.

The objective signs of improvement observed in the experimental group were not substantially greater than those which occurred in the control group.

It can be concluded that the previously reported favorable results from placental treatments in periodontal disease were due more or less to psychologic reactions elicited by the time-consuming and comparatively painful procedures rather than by direct effects.

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Oral surgery

Surgical correction of facial asymmetry

(Zur Problematik der chirurgischen Korrektur der Gesichtsasymmetrie)

S. M. Davidoff. *Deut. Stomat.* 7:207-211
April 1957

At the Clinic for Oral Surgery of the Dental Faculty of the University of Sofia, Bulgaria, restorative oral and plastic surgery are used successfully to correct congenital, acquired and developmental defects in the maxillofacial region. Among the defects frequently treated is the so-called "facial asymmetry" which often leads to malrelation between dental arches and jaws, retraction or protrusion of the mandible, open bite and malocclusion.

Surgical correction of facial asymmetry is designed to improve permanently the esthetic appearance of the patient's face and to correct disturbances of masticatory and speech functions. In all instances in which the facial deformity is pronounced, immediate surgery is indicated. In instances of moderate deformity, however, surgery should not be undertaken lightly.

In his desire to achieve the most favorable esthetic effect, the surgeon should not attempt surgical impossibilities or be misled by unimportant side issues. Correction of facial asymmetry and malocclusion cannot be obtained simply by bone cuts. The real issues to be considered prior to operation are the facial outline, including the profile and lateral breadth, and the occlusion to be obtained ultimately. The immediate occlusion, however, is of secondary significance.

In the case presented, a severe retraction of the mandible, especially extreme on the left side, existed. The lower dental arch appeared to be in an abnormal relation to the upper.

The initial cut was made through the vertical ramus. The mandible was moved forward until the desired position was reached. Postoperative



Before surgery

occlusion and facial outline were considered. The jaws were held in position by inserting soft cement between the grinding surfaces of the molars, and by fixing the lower incisors to the upper with stainless steel wires. Additional fixation at the site of the incision appeared to be unnecessary. The preoperative extreme sagging of all facial muscles was corrected by inserting tantalum wires which were passed from the temporal region to several points of the cheek and the corners of the mouth. In some instances, it is necessary to resort to bone grafting in attempts to restore the facial contour, especially if malunion has caused a shortening of the jawbone.



After surgery

Suturing of all skin incisions is made in zigzag stitches so that contractions that occur with straight vertical scars are avoided.

The surgical procedure is comparatively simple. After uneventful healing periods, orthodontic treatment and, if necessary, prosthetic restoration should follow. In instances in which some esthetic defects remain, plastic surgery should be employed.

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Replantation of single-rooted teeth

(Ein Beitrag zur Replantation einwurzeliger Zähne)

K. L. Walter. *Zahnärztl. Rundschau* 66:315-318 Aug. 5, 1957

It has been demonstrated, clinically and experimentally, that the replantation of teeth into the alveolar sockets from which they had been extracted or otherwise removed, usually after proper root canal treatment and scraping of the roots, results in the majority of instances in normal adherence and adequate function.

The most significant factor in obtaining successful replantation, especially of single-rooted teeth, is the intact condition of the investing and supporting tissues.

In serial experiments with different species of rodents, Axhausen and Hammer have demonstrated that the replantation of vital incisors is not only possible but that a high degree of function and esthetics can be achieved. One year after replantation, almost all reinserted incisors were firmly in position, functionally sound and had normal color and luster. In isolated instances a slight discoloration occurred which probably was caused by the lack of translucence prior to the replantation.

In the reinsertion of human teeth, the only obstacle to overcome is the extrusion of the replanted tooth from the line of occlusion. Such an extrusion is prevented by simple wiring through small incisal holes. There is no need for the use of complicated appliances. The prognosis is favorable.

Replantation of permanent incisors is indicated if: (1) the patient's health is satisfactory; (2) the

patient's age seems conducive to an optimum repair; (3) there are no root fractures; (4) the tooth had undergone proper endodontic treatment; (5) a healthy tooth had been extracted erroneously; (6) a healthy tooth had been eliminated by an accident; (7) the reinsertion can be carried out aseptically; (8) the investing and supporting tissues are intact and healthy; (9) neither systemic disease nor infection is present, and (10) the patient shows an intelligent understanding of the fact that replantation is not successful in all instances.

Replantation of permanent incisors is contraindicated if: (1) systemic disease or infection is present; (2) periodontal disease has been inadequately treated and has produced significant destruction of alveolar structures; (3) unfavorable anatomic conditions present hazards to replantation or the healing process, and (4) infectious processes are present in the oral cavity.

Two cases are reported. Four months after replantation of vital upper lateral incisors lost in traffic accidents, complete healing by primary union was observed in the periodontal membrane. The replanted teeth were firmly established in the dental arch and permitted undisturbed masticatory function although they did not respond to electrovitality tests. Color and luster of enamel were excellent. There was no pain or swelling over the apexes of the replanted incisors.

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Postoperative care of oral surgical patients

(Postoperative Behandlung von Patienten nach chirurgischen Eingriffen in den Zahn-, Mund- und Kiefergebieten)

W. D. Wylie. *Anaesthesist* 6:288-299 Oct. 1957

After oral surgical interventions it is often difficult to distinguish between the effect of surgery and that of anesthesia. Both may contribute to the production of postoperative unconsciousness. Anesthesia, therefore, can be considered perfect only when it ceases as soon as the surgeon completes the operation. The level of consciousness and the state of reflex activity are the guides to the patient's postoperative condition. Unfortunately neither oral surgery nor any form of anes-

thetia are invariably perfect, and their combined effect may create complications. The immediate postoperative period, therefore, is of considerable importance.

The sensitive intracranial mechanism, already disturbed by the surgical intervention, easily may become unbalanced by seemingly trivial incidents occurring during and after anesthesia. A brief anoxic episode or a sudden rise in the carbon dioxide level of the blood may affect the patient's chance of recovery. Either can cause a cerebral edema.

Even successful oral surgery—successful by the standard of removing an oral tumor completely—may be followed by nerve palsies, vasomotor collapse, hyperpyrexia or respiratory disturbance.

The hazards of the postanesthetic and postoperative periods and the special requirements of the patient are strong indications for the provision of recovery room space next to the operating room so that both the surgeon and the anesthesiologist are within sight and sound of the patient at this potentially critical time.

Postoperatively administered, drugs are as likely to impede recovery as they are to help. Failure to keep the airway open for even a few moments after oral surgery may jeopardize the patient's life.

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Utilization of the benzathine penicillin G brand "Tardocillin Leo" in dental practice
(Über die Verwendung von "Tardocillin-Leo," N,N-Dibenzyläthylendiamin-Dipenicillin G, in der Zahnheilkunde)

Hans Karl Schrader. *Schweiz. Mschr. Zahnk.*
67:697-701 Aug. 1957

Recently, benzathine penicillin G, a new repository penicillin compound, was synthesized. It provides detectable levels of penicillin in the blood for prolonged periods after administration. Benzathine penicillin G is available under several proprietary names such as "Tardocillin Leo," "Penadur LA," and "Bicillin" (Wyeth).

Benzathine penicillin G is an odorless, white, crystalline salt which is barely soluble in water, moderately soluble in alcohol and fairly soluble in

formamide. It is prepared by the chemical combination of two molecules of penicillin G with one molecule of the dibenzylethylenediamine base. It is stable in a dry, powdered state or in an aqueous suspension for at least two years. Its toxicity, tested in experimental animals, is similar to that of procaine penicillin.

At the Dental School of the University of Bern, Switzerland, a study was made to evaluate the effect, efficiency and applicability of Tardocillin Leo in dental practice.

Benzathine penicillin G was administered in from 300,000 to 2,500,000 I.U. as a preventive and therapeutic agent to 121 patients after major oral surgery. The patients' ages ranged from 6 to 50 years. The following dosage schedules for different groups of patients were employed: (1) 300,000 units given intramuscularly once a week; (2) 600,000 units given twice a month, and (3) 1,250,000 units given once a month.

Tardocillin Leo was administered in a preparation containing 600,000 units per millimeter suspended in a polyvinylpyrrolidone vehicle.

After single injections, low levels of penicillin were detectable in the serum for an unusually long period. These single injections were effective in eliminating all postoperative infections and inflammations.

Local reactions to benzathine penicillin G were less severe than those occurring after administration of procaine penicillin. Sensitization to this penicillin compound was not observed. No complications occurred when Tardocillin Leo alone was used as a preventive agent after oral surgery. It was tolerated better than any other antibiotic or antibiotic combination.

Dental Institute of the University of Bern, Switzerland

A prosthetic mandibular head: case report

Stuart Gordon. *Plast. & Reconstr. Surg.* 20:62-64
July 1957

The loss of one or both condyles by a patient can be compensated for by training so that the development of an open bite is prevented. If the patient is not cooperative and intelligent, more radical treatment is indicated.

A 31 year old psychopathic man was admitted to the Sunnybrook Hospital. He had suffered a fracture-dislocation of the left condyle and a fracture of the right condyle without displacement during a grand mal seizure two days before. Within three weeks he was developing an open bite despite attempts to obtain his cooperation in preventing this.

The left condyle and neck of the condyloid process were excised and replaced by an acrylic prosthesis of similar shape. The stump of the condyle was flattened and a notch cut in the sigmoid notch. The two leaves of the lower portion of the prosthesis were placed one on each side of the ascending ramus and the prosthesis locked by fitting a projection into the notch previously made. Final fixation was by wire ligature, passed through a hole drilled in the ascending ramus. The two leaves of the appliance were brought together by twisting the wire tightly.

After the operation, the patient's mandibular function became normal but he had a partial facial palsy on the left side. The palsy slowly disappeared within a few months. No untoward signs or symptoms have resulted from the presence of the prosthesis.

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The results of 604 uranoplastic operations (Rezultaty 604 operatsii radikalnoi uranoplastiki)

M. D. Dobow. *Vestnik Chir.*, Moscow 78:4:80-86 April 1957

A. A. Limberg in 1926 recommended a "radical uranoplastic" operation for cleft palate. This operation has been performed by his co-workers and pupils up to the present.

The operation involves three stages: (1) palatorrhaphy, using Langenbeck's incision; retrotransposition, shifting the mucoperiosteum of the hard palate backwards to lengthen the soft palate, using the incisions of Lwow, Ganzor and Dobow; mesopharyngoconstruction with Ernst's method, with Limberg's interlaminar osteotomy in which a longitudinal incision through the pterygoid plate is made and the medial plate with muscles

attached is displaced towards the midline. Thus the mesopharynx is narrowed, the arch vault lifted and the function of the soft palate improved.

After the operation an occlusal celluloid plate is inserted to protect and immobilize the palatal flaps.

In the clinics of several Leningrad medical institutions, under Limberg's supervision, 623 uranoplastic operations were performed in the years 1926 to 1941 and 1945 to 1950. The patients' ages were: under 4 years, 107; from 4 to 7, 87; from 7 to 10, 91; from 11 to 15, 132; from 16 to 20, 110; from 21 to 30, 86, and over 30, 10.

Six hundred and four patients were under regular observation. A complete closure of the cleft was obtained in 580 (96 per cent). The operation was unsuccessful in 24 patients, with complete separation of the edges in five patients and partial separation in 19 patients. A normal soft palate, without tension and shortness, resulted in 85.3 per cent of the patients. The speech of 122 patients was studied; improvement was noted in 115.

No complications are connected with the operative technic. It is suitable in all forms of cleft palate and can be effected in one session. Mortality is low and occurs chiefly in children under three years old.

Postoperative orthopedic and logopedic treatments further improve the results.

Finliandskii Prospekt 3, Leningrad, U.S.S.R.

The status of oral surgery

Kurt H. Thoma. *New England J. Med.* 257:871-875 Oct. 31, 1957, 257:927-931 Nov. 7, 1957

The dental profession acclaims oral surgery as a well-established specialty of dentistry. It was under the aegis of dentistry that this specialty developed. Simon P. Hullihen is recognized as the first oral surgeon in the United States, and James E. Garretson (1828-1895) is known as the father of oral surgery. He named the specialty "oral surgery" and he introduced it as a major subject in the dental curriculum of the Philadelphia Dental College, now the School of Den-

tistry of Temple University. Garretson and his contemporaries—Thomas Fillibrown, Truman W. Brophy, Matthew W. Cryer, Thomas L. Gilmer and George V. Brown—limited their practice to surgery of the mouth and jaws. These outstanding men developed oral surgery at a time when the oral cavity was a no man's land of the human anatomy. Although all had both medical and dental degrees, they attached their activities to dentistry, realizing that this was where oral surgery belonged. They taught their specialty in dental schools and published their methods in the existing dental literature.

In 1929 the American Society of Oral Surgeons was incorporated in Illinois as a component part of the American Dental Association. Today the Society has more than 700 members. In 1946 the American Board of Oral Surgery was incorporated in Illinois. It was approved by the Council on Dental Education of the American Dental Association in 1947, and authorized to proceed in the certification of specialists in oral surgery.

The American Dental Association appointed a special committee to study the relation of oral surgery to medicine. In 1953 the House of Delegates of the American Medical Association approved a definition of oral surgery that was unacceptable to the dental profession. Its definition of oral surgery, in contrast to that of the American Dental Association, was "that the oral surgeon be assigned to a surgical service of a hospital and perform such professional duties as the chief of the surgical service directed . . . Dental-oral surgery is to be limited to the diseases of the teeth and jaws and lesions of contiguous soft tissue related to diseases of the teeth and jaws but excluding malignancies."

This definition is not valid. The American Medical Association has no legal right and no professional privilege to define the specialty of another profession. How presumptuous it would be for dentistry to define otolaryngology or plastic surgery.

In spite of a report of its Board of Trustees approving dentistry's definition of oral surgery, the House of Delegates of the American Medical

Association has refused to rescind its definition. The special committee of the American Dental Association believes that no further pressure should be applied to have the American Medical Association rescind its "definition" until an educational campaign on the issues involved has been directed to the members of both professions and to selected and influential lay persons.

Today graduate courses in oral surgery are offered by 21 Universities.

The oral surgeon is primarily a dentist. His desire is not to practice medicine but to practice a specialty of his own profession covered by statute. All the graduate courses and the practical training for the oral surgeon from the earliest times have been and are offered by the dental institutions in America. Medical schools and present hospital training centers make no provision for coverage of this phase of health care.

All branches of the Armed Forces have assigned oral surgery to the Dental Corps.

Oral surgery has its own literature, firmly entwined with the dental literature. The *Journal of Oral Surgery* is a publication of the American Dental Association; *Oral Surgery*, *Oral Medicine and Oral Pathology* combines the science and practice of oral surgery with allied subjects. Most of the well-known dental journals here and abroad have oral surgery sections. Many of the health insurance programs recognize oral surgery.

The specialty of oral surgery has a great future. The skill of the dentist and his understanding of the function and pathology of the teeth and jaws, combined with the basic medical training that he receives today in his postgraduate courses, will help him provide the best service to the communities that he will serve. This is the test of whether a health service is good or bad. As the layman's education expands, he will seek and demand oral surgery services from a qualified oral surgeon; as things now stand, the only source of qualification and specialty recognition is that offered by the profession of dentistry. Dentistry as a profession and dentists as rugged individualists will protect this specialty.

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Endodontics

Bleaching of the discolored pulpless toothHyman H. Pearson. *J.A.D.A.* 56:64-68 Jan. 1958

Discolored pulpless teeth may be bleached successfully. The secondary discoloration which may appear after a successful primary bleaching is caused by the pigmenting substances contained in the oral fluids; secondary discoloration may be prevented by hermetically sealing the enamel as well as the dentin.

The described bleaching technic, which eliminates certain causes of failure experienced in the past, should be undertaken only after the health of the root and periapical tissues has been restored and the canal hermetically sealed. The technic is as follows:

1. The tooth is scaled and polished.
2. A coating of petroleum jelly is applied to the labial and lingual gingival tissue investing the discolored tooth and its two contiguous teeth, under the free gingival margins and in the interproximal spaces.
3. The rubber dam is punched with the smallest hole possible and is held in place by means of a double winding of dental floss, double knotted under the gingiva, as far as it will go into the gingival crevice without causing trauma.
4. All filling material and decay are removed, plus the contents of the pulp chamber. The canal is voided of its contents to a depth of 3 mm. apically to the gingival level.
5. All the exposed tooth tissue is washed with chlorinated soda solution, some of which is allowed to remain in the cavities for about one minute and then washed away with warm distilled water, and the tooth is dried. All vestiges of the petroleum jelly are washed from the surface of the tooth. A mixture of one part ethyl alcohol, 95 per cent by volume, and two parts chloroform, chemically pure, is used to desiccate all the ex-

posed enamel and dentin. This is allowed to remain in the cavities for two minutes and is aspirated, using a "sealed to the tooth" aspirator tip.

6. An ether-peroxide mixture (Pyrozone) is used as the bleaching agent. A pellet of cotton is placed in the pulp chamber and the cavities and is saturated with the ether-peroxide mixture by means of a curved glass dropper. The solution is then forced into the dentin by using a pump composed of a soft-rubber polishing cup mounted on a porte-polisher. The cotton may be saturated several times, and the pumping may be repeated with the rim of the cup resting on the enamel beyond the cavity margins.

7. The tooth is covered with a strip of muslin or cotton dental napkin cut to fit the entire labial and lingual surfaces, and the tail end is tucked into the cavity to meet the cotton pellet that was placed in the pulp chamber. The muslin and the cotton pellet are saturated with the ether-peroxide mixture, with the muslin acting as a wick.

8. The patient's face is covered with a wet towel to protect it from the rays of the bleaching lamp, a no. 2 photoflood lamp, which is held about 20 inches from the tooth for about 20 minutes. The cotton is repeatedly replenished with the ether-peroxide mixture about every five minutes or as it evaporates.

9. The muslin strip and the remaining pellet of cotton are removed, and the cavities are dried by a blast of warm air. A dressing of 30 per cent hydrogen peroxide in water is placed in the pulp chamber, and all cavities are sealed with a white oxyphosphate of zinc cement. The oxygen from the dressing will attempt to force its way through the setting cement and will cause a leaky filling unless the cement is covered immediately with a piece of rubber dam or a plastic strip held in place by finger pressure until the cement is set. After the cement sets and just before the rubber dam is removed, the tooth is coated with petroleum jelly to seal the enamel temporarily. The first treatment is completed. Three days should elapse before the second treatment.

10. At the second or subsequent sittings, the rubber dam is applied. The tooth is cleansed of petroleum jelly and other deposits by using prophylactic polishing paste; then it is washed and desiccated with the alcohol-chloroform mix-

ture. The filling material is removed, and the bleaching process is repeated until the tooth becomes perceptibly lighter in color than is required. At the last sitting, the rubber dam must not be removed until all the dentin and enamel surfaces are hermetically sealed, as follows:

11. All the exposed dentin and enamel on the labial and lingual surfaces and the walls of the cavities and pulp chamber are painted with a self-curing acrylic resin monomer; a camel's-hair brush is used for this purpose. Several coats are applied, each after the last has been absorbed. The tooth is exposed to the photoflood lamp for five minutes. The lamp is turned off, and the brush technic is used in filling the canal and pulp chamber with a light shade of self-curing filling acrylic resin. The tooth is exposed to the photoflood lamp again for eight minutes to complete polymerization of the acrylic resin monomer as well as of the filling proper.

12. Retention points are prepared in all the cavities, which then are filled with a synthetic porcelain.

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An improved root canal cement

Louis I. Grossman. *J.A.D.A.* 56:381-385
March 1958

A new root canal cement developed by the author has the following formula:

Powder

Zinc oxide, C.P.	40 parts
Staybelite resin	30 parts
Bismuth subcarbonate	15 parts
Barium sulfate	15 parts

Liquid

Eugenol, C.P.	5 parts
Oil of sweet almond	1 part
Pass through 100 mesh sieve.	

This cement has smooth working qualities, plasticity, adhesiveness and radiopacity. It will not discolor tooth structure. It allows the operator about 20 minutes in which to make correction of the root canal filling, if necessary, before the cement sets hard. The cement is soluble in

ethereal solvents and can be removed from the root canal. The cement has been used clinically and appears to be nonirritating to the periapical tissue.

Care should be used in mixing the cement. The cement powder should be placed on a sterilized glass slab. Two drops of the cement liquid are placed on the slab for filling an anterior or bicuspoid tooth, whereas three drops of liquid should be used for a molar. Spatulation should be deliberate, with small portions of powder being completely incorporated into the liquid. As much as two or three minutes of spatulation often are necessary for each drop of liquid.

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The use of electric pulp testers in dental practice

D. H. Cartledge, C. Cooke and T. C. Rowbotham.
Brit.D.J. 104:64-66 Jan. 21, 1958

A suitably designed electric pulp tester is a useful diagnostic aid, but it must be used intelligently and its limitations borne in mind. The electric pulp tester is the method of choice for all teeth, for determining whether or not a pulp is vital.

A Cooke-Rowbotham high voltage pulp tester has been in constant use in the conservation clinic of the Turner Dental School for five years, during which time more than 15,000 teeth have been tested. It has been found that, with a standardized technic and provided the teeth are normal, similar teeth will give almost identical readings on a calibrated potentiometer scale. The crown of the tooth should be dried thoroughly and not allowed to contact the tongue or cheek. The electrode, covered with a little tooth paste, must be placed on sound enamel 3 or 4 mm. from the gingival margin. The hand electrode is grasped firmly by the patient and the apparatus switched on. The indicator on the potentiometer scale is advanced slowly until the patient experiences a sharp sensation, which is not unduly unpleasant unless the threshold of stimulation is exceeded. The rubber-covered hand electrode acts as a condenser coupling. The incisal edge or the occlusal surface of a tooth usually gives the lowest reading but this is not the surface of choice, as attrition

often exposes dentin which will give a subnormal reading.

The irritability of the nerves in the pulp is dependent on, and varies with, the metabolism of the pulp which in turn is influenced by physiological and pathological changes in the tissues. The commonest pathological changes are inflammatory and degenerative. The suspected tooth always must be compared with a known normal similar tooth, using an identical technic and electrode site.

Three types of reading are possible when the pulp is vital: (1) raised threshold compared with normal; (2) lowered threshold compared with normal, and (3) normal threshold.

If the threshold is raised the pulp is considered to be degenerative or dying, as both conditions exhibit lowered nerve conductivity. The pulp readings will not differentiate between partial necrosis and degeneration, but when the readings are combined with other clinical signs and symptoms and a careful case history, the pathologic condition often can be deduced.

If the threshold is lowered, the usual interpretation is pulpal hyperemia or early acute pulpitis.

If the threshold is normal and the tooth symptomless, the pulp probably is normal; however, a normal threshold can be the most difficult reading to interpret because teeth at a certain stage of acute pulpitis and also teeth with chronic pulpitis generally give normal readings. In instances of acute pulpitis, other clinical signs and symptoms are obvious and the pulp rapidly becomes necrotic. With chronic pulpitis, however, there are often few signs and symptoms; pain, when it does occur, is of a neuralgic type often referred and not localized.

The foregoing interpretations of the various readings have been found to be very consistent when testing single-rooted, all noncarious and most carious teeth. Difficulties may arise, however, when testing filled or carious teeth as the restorations or lesions alter the electrical resistance of the tooth so that it is not possible to find a similar tooth for comparison. Although the readings obtained on teeth which contain large restorations will indicate whether a pulp is vital, it may not be possible to determine whether the

threshold is raised, lowered or normal. The electric pulp tester will not help to diagnose a chronic pulpitis.

The electric pulp tester may help in the diagnosis of pulpal disease but its readings always must be related to the other signs and symptoms present.

Turner Dental School, University of Manchester, Manchester, England

Iontophoresis as a method of treating acute and chronic periodontitis in cases of teeth with impenetrable canals or those which cannot bear hermetic filling

(Letshenije metodom ionogalvanizatsiji ostrych i chrohitsheskich periodontitov zubov s neprochodimymi kanalami i zubov ne vyderzhivajushch germetizma)

G. A. Gruzdeva. *Stomat., Moscow* 36:19-20 Jan.-Feb. 1957

In instances where root canals could not be cleansed properly by mechanical and chemical means, iontophoresis has been recommended as the only method of treatment by which the medicament could be introduced to the apical foramen.

Few dentists have adopted this method because of its complicated technic. In recent years, since it has been simplified by L. R. Rubin, this method of treatment has been used widely in the Central Stomatologic Polyclinic of Moscow.

One hundred seventy-five teeth, marked for extraction, were treated for evaluating this method. After 12 to 16 months those teeth were examined clinically and roentgenographically.

Iontophoresis failed in only five teeth. Twenty teeth served satisfactorily as abutments for bridges and for crowns. The roentgenographic examination showed in five instances of chronic periodontitis an insignificant restoration of bone tissue, in three teeth with impenetrable root canals a granulation tissue and in the remaining 93 teeth no changes in the periapical tissue. Evidently, 95 per cent of teeth which could not be treated by other means were saved.

Pedodontics

Fractures of children's incisors

(Frakturierte Frontzahn-Ecke bei Kindern)

Walter Sutter. *Schweiz.Mschr.Zahnhk.* 67:823
Sept. 1957

The restoration of fractured occlusal surfaces or incisal edges of deciduous anterior teeth seems to be one of the most unpleasant and thankless tasks in dental practice.

In most instances, the routine insertion of gold cast inlays will result in unfavorable and unesthetic changes in the child's facial appearance. Adequate anchorage can be obtained only by overcoming many difficulties.

A recently introduced restorative method to crown fractured deciduous teeth (incisors or cuspids) with self-curing acrylic resin appears promising. This method, indicated only for teeth with a vital pulp, usually produces esthetically and functionally satisfying results.

During the first sitting, roentgenograms are taken to determine the extent of the fracture and its effect on dentin and pulp. If the damage to tooth structures is not severe enough to contraindicate the application of acrylic crowns, the fractured tooth surfaces are equalized by careful grinding.

During the second sitting, two parallel channels, 0.8 mm. in diameter, are drilled into the intact portion of the tooth. In lateral fractures, the vertical channel should be deeper than the horizontal channel to facilitate the insertion of a gold wire (0.8 mm. thick). The exposed dentin is impregnated with a plastic dressing. The inserted gold wire is embedded and the exposed dentin covered with silicate cement. The fractured oc-

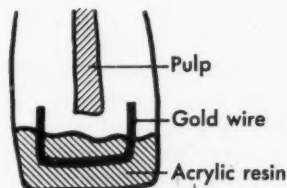
clusal surfaces or incisal edges are reconstructed with free-flowing self-curing acrylic resin.

During the third and last sitting, the already hardened acrylic restoration is sculptured and polished.

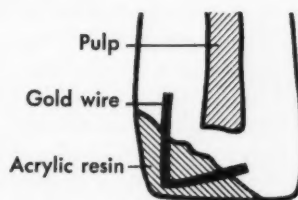
This type of reconstruction can be regarded only as a temporary procedure. Although in most instances the acrylic restoration will function until the deciduous tooth is shed, if such fractures occur when the child is young, a more permanent type of service, to replace the acrylic restoration, is indicated.

During the last four years, this method has been tested at the clinics of several Swiss dental schools and has been found satisfactory for pedodontic practice.

Schützenstrasse 23, Biel, Switzerland



Restoration with self-curing acrylic resin of a fractured occlusal surface of a deciduous incisor



Restoration with self-curing resin of a fractured edge of a deciduous incisor

Demand for pedodontic service in France
(La demande en soine infantiles)

A. Besombes. *Rev.franç.odontostomat.* 4:171-178
Feb. 1957

The great majority of French children have never been shown why and how they should keep their teeth and mouths healthy and clean. The French dental profession must accept much of the blame for this failure. Proper education and training in oral health and hygiene and the introduction of preventive procedures can reduce the caries incidence by 55 per cent.

Recent statistics on the dental condition of preschool and school children in continental France, published by the French government, revealed that in 1954 there were 8,902,000 children. It was estimated that in 1960 there will be about 10,325,000 children. Today, the French already speak of an "inflation in children."

The same source gives the following data on the caries incidence: carious lesions were found in more than 50 per cent of the three year old children, in more than 70 per cent of the four year old children and in more than 75 per cent of the five year old children. In school children, from 6 to 14 years old, carious lesions of varying degree were present in more than 90 per cent. More than 20 per cent of the school children required immediate orthodontic treatment.

Comparative statistics on the dental condition of preschool and school children in England, published by the British government, revealed the following data on the tooth conditions in cities in which pedodontic service in kindergarten and school dental clinics has functioned successfully for about ten years: carious lesions were found in less than 30 per cent of the three year old chil-

dren, in less than 40 per cent of the four year old children and less than 45 per cent of the five year old children. In school children, from 6 to 14 years old, carious lesions of varying degree were present in less than 50 per cent.

The essence of pedodontic service is planned treatment. The French dental profession must strive to have the dental care of the nation's children under its exclusive control.

If the following demands were granted, the tooth condition of the French children would be improved immensely and the oral and general health of the future generations would be promoted and safeguarded:

1. Immediate introduction of obligatory periodic dental examinations of preschool and school children.

2. Pedodontics and school dentistry should be made important parts of the curriculum of dental schools.

3. Precautionary steps should be taken to permit undisturbed calcification of the deciduous and permanent teeth.

4. Informative courses on the significance of oral hygiene should be made available to parents and teachers.

5. Fluoridation of drinking water as an effective procedure to prevent caries should be compulsory in all communities having a public water supply. In other communities, different methods of fluoride application (topical, tablets, milk or salt) should be introduced.

These urgent demands can be realized only by cooperation between governmental authorities, dental organizations, educators and parents.

L'Ecole Dentaire, Paris 5, France

Biochemistry

Studies on B-vitamins and estrogens in oral cancer

V. R. Sathe, V. R. Talageri, V. R. Khanolkar and T. B. Panse. *Indian J.M.Res.* 45:401-409 July 1957

Various etiologic factors, such as deficiency of the constituents of the vitamin B complex, alteration in metabolism of sex hormones, tobacco chewing or smoking, dental sepsis and syphilis have been associated with precancerous lesions in the mouth, such as atrophy of the papillae of the tongue, leukoplakia, glossitis and angular stomatitis.

Oral cancer accounts for nearly 20 per cent of all malignant diseases in patients attending the Tata Memorial Hospital, Bombay. Sixteen men with oral cancer were studied; 12 had cancer of the base of the tongue, two of the cheek and two of the oropharynx. Diagnosis was established by punch biopsy. All were habitual smokers. Sixteen normal men served as controls.

Both groups were hospitalized and kept on a normal hospital diet. Urine was collected for an estimation of the creatinine, thiamine, riboflavin and estrogen levels. On the third and fourth days of admission, test doses of nicotinic acid, thiamine and riboflavin were given orally and the urine examined for estrogen content. On the fifth and sixth days the urine was analyzed to determine the excretion levels of the vitamins and estrogens before the administration of estrogens. The first test dose was given on the seventh and the second on the eighth day. Thiamine and riboflavin levels in the urine were determined on the seventh and eighth days.

The excretion levels of thiamine and riboflavin in the cancer patients were lower than normal, and that of estrogens higher. Administration of

vitamins led to an increase in the excretion of estrogens in the cancer patients but not in the controls. Administration of estrogens to the cancer patients decreased the excretion levels of thiamine and riboflavin, but in the controls the values were unaltered.

The mean basal excretion level of thiamine in patients with oral cancer was significantly lower than that of the controls, indicating a gross deficiency of thiamine in the cancer patients. A low urinary output of riboflavin also was observed in the cancer patients. The basal excretion level of estrogens was significantly higher in cancer patients than in the controls. Loading the body with exogenous estrogens created a state of extraordinary deficiency of vitamins B₁ and B₂, which are involved in estrogen metabolism. Administration of the vitamins in the amounts used increased the excretion levels of estrogens, the increase being helpful in restoring the hormonal imbalance.

Estrogen treatment appears to be harmful in men with oral cancer, as it induces a deficiency of thiamine and riboflavin.

Tata Memorial Hospital, Bombay, India

Clinical significance of antistreptococcal reactions (Die klinische Bedeutung der Antistreptolysin-Reaktion)

F. Scheiffarth and G. Berg. *Deut.med.Wschr.* 82:1690-1692 Sept. 27, 1957

The antistreptococcal titer in 1,455 patients afflicted with various oral infections was determined at the Bacteriologic Institute of the University of Erlangen, Germany.

Titers of up to 200 I.U. per millimeter were considered to be within normal limits. In some patients, however, titer values of about 20 per cent higher were observed. Such an increase probably was due to nonspecific factors or latent oral infections.

In instances of infections with *Streptococcus pyogenes*, the titer usually was at its peak during the fourth week after the onset of the oral infection. During the fifth week the titer returned to normal. Continued elevation, however, indicated the persistence or spread of the infection.

An early antibiotic treatment prevented the development of streptolysin in the majority of instances. Antibody reaction did not occur, and the antistreptococcic titer remained almost normal.

In oral infections with *Str. pyogenes* and in various anti-infectious-allergic reactions (513 patients), the antistreptococcic titer was elevated in about 50 per cent. In stationary types of degenerative diseases in the bones of the maxillofacial region, primary chronic arthritis of the temporomandibular joint or ankylosis of the joint (393 patients), an elevated antistreptococcic titer occurred in 20 per cent. In the remaining instances of oral infections (549 patients), the average elevation of the titer was also 20 per cent.

The comparatively high incidence of a non-specific elevation in the antistreptococcic titer requires that the results of this investigation should be evaluated critically and be applied to clinical practice only in conjunction with the individual clinical findings.

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Blood-groups in tumours of salivary tissue

J. Malcolm Cameron. *Lancet* No. 7014:239-240 Feb. 1, 1958

In view of the increasing evidence of a relationship between blood groups and certain diseases, the author in the past two years has ascertained the blood groups of 341 patients with tumors of salivary tissue. Of the 341 patients, 206 (60.4 per cent) were in blood group A, 25 (7.3 per cent) in group B, 100 (29.3 per cent) in group O and 10 (2.9 per cent) in group AB.

The general results were compared with those obtained in a control series of 5,898 consecutive blood donors at the regional blood transfusion center in Glasgow. Statistically, the preponderance of group A in the tumor series is highly significant. In the control series only 32.3 per cent were in blood group A, and 53.9 per cent were in group O.

The unusually high incidence of blood group A in this series of patients with salivary tumors is all the more striking because in Scotland group A is found in a smaller proportion of the population than in England.

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Concurrent concentrations of human salivary buffer components in serum and saliva

Samuel Dreizen, Henry A. Spies, Jr.,
Jo G. Dreizen and
Tom D. Spies. *Proc. Soc. Exper. Biol. & Med.*
96:499-501 Nov. 1957

The buffer systems in human saliva constitute a major natural defense mechanism against dental decay. Quantitatively, the buffer concentration of saliva varies with glandular activity, stimulated saliva having an appreciably higher buffer level than unstimulated saliva.

Numerous investigators have shown that the salivary buffer capacity of caries-resistant persons exceeds that of caries-active persons. In a given subject under physiologic conditions, the buffer concentration of saliva varies only slightly from hour to hour and from time to time.

The present study compared the buffer components and buffer capacities (range from 7 to 6 pH) of paraffin-stimulated whole saliva and blood serum in 34 patients of the Hillman Hospital, Birmingham, Ala., from whom samples were collected simultaneously.

In every patient the buffer capacity of serum exceeded that of saliva in the pH range tested. In each patient, saliva contained higher concentrations of potassium and phosphate than did serum, and serum contained greater concentrations of sodium, bicarbonate and protein than did saliva.

There was no statistically significant correlation between the buffer capacities and the main buffer constituents of serum and stimulated whole saliva.

Thus, the quantitative composition of the salivary buffers which act to protect against dental caries is determined primarily by glandular activity and not by simple ultrafiltration.

By selective action on blood electrolytes, the salivary glands produce a secretion which is hypotonic to serum, a property unique among the major glandular secretions of the alimentary tract. The demonstration by Lilienthal (1955) that oral microbial flora and saliva sediment contain buffer substances indicates that both glandular and extraglandular sources contribute to the total buffering capacity of saliva.

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General

Bleaching fluorosis stained teeth

Charles F. Bouschor. *J.Oklahoma D.A.* 47:6-7
Jan. 1958

In areas where the drinking water contains an excess of fluoride, a child's developing permanent teeth may acquire a stain, varying from a light brown to a dark, unsightly brown. The stain assumes no definite pattern and can occur on any area of the teeth. Often, the teeth also may have white, chalky enamel with the brownish fluoride stain. The white enamel is caused by the lack of cementing substance between the enamel rods.

Excess fluoride has no detrimental effect on the teeth after they have developed; it will not discolor the permanent teeth. To acquire stain on the teeth, the patient must be in the endemic area during the period his permanent teeth are developing. Some children in endemic areas do not acquire fluorosis. To bleach teeth stained by excess fluoride, the following treatment is recommended:

A surgical sponge is placed over the labial surface of the gingiva under the upper lip, to protect the tissue from the bleaching liquid. A second sponge is placed to cover the upper lip and protect it from the bleaching solution. A rubber dam is applied over the six anterior teeth to be bleached; the dam is extended up over the nose to prevent the obnoxious odor of the solution from entering the nose. Ligatures are placed around the teeth with the loose ends toward the labial surface; with the ligatures a cotton roll is tied on the labial surface of the six anterior teeth, and pressed against the teeth so that the cotton conforms to the teeth. An eye dropper is used to convey the bleaching solution to the cotton, which is moistened but not saturated.

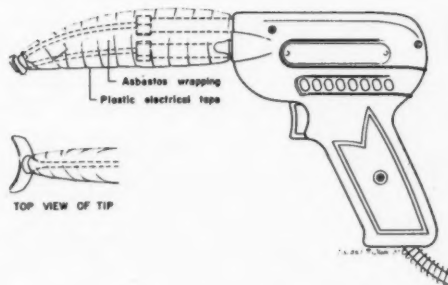
The bleaching solution consists of five parts hydrogen peroxide 30 per cent to one part ether.

A heated electric soldering iron, with the heating elements wrapped in asbestos and wound

with plastic electrical tape (see illustration), is pressed with a rocking motion against the cotton roll. The iron should be hot enough to create steam, and should be applied for about three to five seconds. It should not be held against the cotton roll until the patient has an uncomfortable sensation. The iron is removed for about ten seconds, then reapplied for three to five seconds, and so forth, until the cotton roll becomes fairly dry. The cotton roll again is wetted with the bleaching solution and the heat applied; this procedure continues for from 20 to 30 minutes.

When the treatment is completed, the cotton roll is removed, the rubber dam is left in place, and the operating light is directed on the teeth for from 10 to 15 minutes to aid in the bleaching. The bleaching occurs at this time and continues for several hours after treatment. The bleaching solution causes the soft tissues to turn white and appear as though burned, but this disappears in an hour with no harmful effect.

The patient is instructed to avoid for 12 hours any extreme temperature changes on the teeth, such as those that might ensue from drinking hot or cold liquids. If the heat was applied too fast



or for too long a period, the patient will have pain for about eight hours after treatment; this can be controlled by a mild sedative. At the next treatment the heat should be applied for shorter periods and at shorter intervals.

Treatments can continue until the fluorine stains are removed entirely; generally, however, the improvement from the first treatment is so substantial that the patient is satisfied and does not want to continue the treatments to remove the deeper stains.

Baylor University Dental School, Dallas, Texas

Prescription writing

Council on Dental Therapeutics,
American Dental Association.

Accepted Dental Remedies 23:17-21, 1958

A prescription is a written order or authorization to a pharmacist directing him to furnish certain items to a patient.

A written prescription assures the patient of the benefit of the exact dose of the drug or combination of drugs which should be most effective in the part of dental treatment which can be provided outside of the dentist's office. The prescription emphasizes the fact that the treatment is designed for the individual patient and is not employed on an empirical basis. Prescription writing also may help to discourage self-medication.

Prescriptions also are required because many drugs which are considered habit-forming or too hazardous for use without professional supervision cannot be dispensed by the pharmacist without a prescription written by a dentist or other properly qualified individuals. The labels of such products, introduced into interstate commerce, bear the statement: "Caution: Federal law prohibits dispensing without prescription."

Dental prescription writing is simple but certain essentials should be observed and the dentist should never sacrifice accuracy for speed. Each prescription should satisfy certain basic requirements:

1. It should be typed or legibly written in ink on a properly prepared form without erasures.
2. The name, age and address of the patient and the date should appear.
3. The prescribed drug, the dose unit and the number of units or the total amount to be dispensed should be indicated clearly.
4. Carefully worded directions for use should be given. Oral instructions should be confirmed on the prescription, and such statements as "use as directed" should be avoided unless written instructions have been provided for the patient.
5. The prescription is signed by the dentist. His federal registry number and his address must be given if a narcotic is prescribed.

Simplicity is desirable to avoid errors and to conserve time. The classical prescription, used

several decades ago, was considered an elaborate work of art. Today that type of prescription is neither necessary nor is it considered good form. Technologic advances in preparing dosage forms, the trend away from the use of Latin and the emphasis in modern therapy on the use of one or a few specific drugs have contributed to the simplification of prescription writing.

A prescribed drug may be designated by its generic name or by its brand name. Use of the generic name may give the pharmacist a choice in selecting a brand carried in stock.

There is a decided trend toward the use of the metric system of weights and measures in writing prescriptions. The metric system is official in the *United States Pharmacopeia* and the *National Formulary*. In the metric system the numerals are always written in Arabic characters placed before the name of the unit, for example, 2 Gm., 30 ml., 5 mg. Weights less than 1 gram (Gm.) frequently are expressed as milligrams (mg.). As an alternative procedure a vertical line may be substituted for decimal points in designating the units or their fractional parts for one or more constituents. The unit is always the gram (Gm.) or the milliliter (ml.) which for practical purposes is the same as the cubic centimeter (cc.).

Numerous prepared dosage forms, such as tablets and capsules, are available and, therefore, no instructions to the pharmacist are required for their preparation. In fact, only a few, if any, compounding instructions are required for dental prescriptions. It is seldom necessary in dentistry to prescribe mixtures other than the official (U.S.P. or N.F.) mixtures or others which the Council on Dental Therapeutics of the American Dental Association has classified in Group A or Group B.

A few abbreviations, derived from Latin phrases, sometimes are used in writing the instructions for the patient. These abbreviations include: b.i.d. (twice daily), t.i.d. (three times a day), q. 4 h. (every four hours), a.c. (before meals) and p.c. (after meals).

Printed prescription blanks are not essential but their use saves time and contributes to the appearance of the final prescription. Advertising should never be included on a prescription blank.

222 East Superior Street, Chicago 11, Ill.

An architect looks at small office projects

Thor Hesberg. *J.South.California D.A.* 26:24-25 Jan. 1958.

In selecting a lot for a dental office, the dentist should consider the following points:

1. All rights, restriction, easements, boundaries and contours of the building site must be inquired into and information obtained as to sewer, water, gas and electrical services. Local building department requirements on setbacks, zone, fire zone, and the possibilities of eventual street widening, and parking should be determined.

2. The number of professional suites to be built should be fixed. One rental may pay for two suites in ten years.

3. The office should be located in a commercial zone.

4. The office need not be on a major thoroughfare or main street; residential surroundings with some street parking are preferable, and such lots are less expensive.

5. Quiet surroundings providing privacy and a landscaped scene are valuable, as are existing trees.

6. A sloping area may provide better lot utilization than a level area.

7. The lot should permit the operatories to face north. With a huge roof overhang, a south face is satisfactory. The least satisfactory is a west face. As a rule, lots on the north side of the street are best.

8. A dental office with three operatories needs about 800 square feet. Such an office may be 35 feet wide and 25 feet deep.

9. Building costs may be estimated roughly on the basis of \$15 per square foot for the dentist's own suite, \$12.50 for a rental suite, or \$8 for a rental suite without interior finish.

10. The cost of the lot should not exceed a quarter of the building cost for medium-sized buildings. For small commercial projects, the cost of the lot now often amounts to half of the building cost.

11. The lot cannot be too large. Dental offices require plenty of daylight.

12. The width of a lot is more important than the depth.

13. A corner lot with an alley is helpful for solving the parking problem.

14. Access to the reception room from both the street side and the parking side should be provided.

15. The sound construction of one-story dental offices usually requires a crawl space under the floor; therefore, allowance should be made for ramps and extra space at the entrances.

16. A dental office requires a second and private entrance.

17. Parking requirements must be determined.

18. Parking can be solved more economically and functionally if there are two accesses to the space.

19. One car requires an area of 30 by 15 feet including an adjacent drive for one-sided diagonal parking. A minimum area of 50 by 15 feet is needed for two cars in two-sided diagonal parking.

20. Long driveways and turnarounds are uneconomical.

21. On small lots parking requirements often prevent landscaping and privacy.

22. Careful study of site planning assures the most intelligent choice of a lot.

4317 North Figueroa Street, Los Angeles, Calif.

Iodine-concentrating and iodine-secreting capacity of the salivary glands: investigation with iodine¹³¹

(Über das Jod-Konzentrierungs- und Sekretionsvermögen der Speicheldrüsen: Untersucht mit Jod¹³¹)

K. Gerbaulet and W. Fitting. *Klin.Wschr.* 34:120-125 Feb. 1957

Serum iodine is absorbed and secreted by all salivary glands. The daily secretion of human saliva, from 1,000 to 2,000 ml., contains from 100 to 200 gamma iodine. The entire amount of iodine, however, is not excreted because some parts are reabsorbed in the gastrointestinal tract.

At the Medical Clinic of the University of Cologne, Germany, carrier-free sodium iodide (NaI¹³¹) was injected into 12 patients with sali-

vary tumors. The radioactivity in the salivary glands was measured continuously with a Geiger counter. Blood samples, taken at frequent intervals, and saliva specimens, collected without mechanical or chemical stimulation, were recorded with a scintiscanner.

In a few instances, the organic and inorganic iodide contents of the serum were measured after separation with trichloroacetic acid by paper electrophoresis.

The curves of both the serum and salivary iodide contents decreased initially, followed by a gradual ascent. This seems to indicate the existence of a relationship between the salivary iodide level and the normal function of the salivary glands.

The established ratio between the salivary iodide concentration and the serum iodide concentration was 46 to 141. It can be assumed that the iodine absorbed and secreted by the salivary glands is from 80 to 85 per cent inorganic.

Isotopenlaboratorium, University of Cologne, Germany

Fundamental factors in the practice of odontogeriatrics

(Factores fundamentales en la práctica
de la odontogeriatría)

Fermin A. Silie Gatón. *Rev.A.D.Mexicana*
14:135-142 Jan.-Feb. 1957

The time has come to establish formally a branch of dentistry which will have as its purpose the study of dental disease in the aged. Just as the branch of medicine that deals with diseases of senility or diseases of the aged is called geriatrics, so this branch of dentistry can be called odontogeriatrics.

The various classes of cellular tissues that make up the oral apparatus, especially the nervous tissues, cannot react to changes of organic condition and dynamics within the mouths of the aged as they do in the mouths of others. Hence the causes, development, and sequelae of pathologic conditions in the mouth of an old person are characteristic of his age.

The number of dental cripples to be found among the aged, regardless of their social class or economic status, is shocking. In a survey of

80 persons from 70 to 90 years old living in old peoples' homes, 27 had no teeth; 48 had an insufficient number of teeth, and only 5 had a sufficient number. A concurrent medical examination of the same persons showed 33 with chronic constipation, 10 with dyspepsia, 3 with anorexia, 2 with gas, 47 with other conditions, and only 15 whose health was clinically good. Gastrointestinal disturbances and their complications generally are regarded as a natural accompaniment of old age, but those who have adequate prostheses or whose teeth are in a fairly good state of preservation enjoy better health than those who lack these advantages. In addition, the dental condition of the aged has a decided effect on their psychological status; isolation from their former associations, which is a common consequence of dental disease, tends to make them feel useless and hastens their decline.

The teeth in old age are characterized anatomically by wear, especially of the occlusal surfaces, and by an appearance of elongation due to retraction of the gums. The teeth are constantly subjected to wear from the time of their eruption until they are lost or the patient dies; consequently, it affects the teeth in the order in which they appear, beginning with the incisors. At first, only the enamel is affected, but as time goes on the dentin, too, is involved. In many of the patients studied, the only protection for the pulp was that afforded by the secondary dentin. The pulp undergoes shrinkage, and the medullary canaliculi and apical ramifications of the pulp become atrophied and begin to disappear after the age of 40. In spite of the effects of wear, senile dentin can be differentiated from primary dentin by the fact that it is softer and contains fewer dentinal tubules. The cementum also presents a characteristic appearance in persons of advanced age, because it predominates at the apex of the teeth and is noticeably whiter there than it is elsewhere. The gums are retracted, often leaving part of the root visible with the crown, and the teeth are fixed firmly in the alveolar sulcus, often surprising the orthodontist by the resistance they offer. Abnormalities of occlusion and relaxation of the muscles of the upper lip may make it difficult for the patient to show the upper teeth in normal conversation. Often, too, they are responsible for the peculiar speech

of the aged edentulous person. The occlusal changes due to altered physiological conditions in the mouth always should be given consideration in the construction of dental prostheses for the aged. Finally, the teeth change color as they grow older, becoming increasingly yellow with age.

Much has been written in recent years about the psychological attention needed by children receiving dental care, but unfortunately no similar effort has been made on behalf of the aged, whose minds are often burdened by emotional problems and those of a social character, which in most cases are responsible for bringing them to the dentist's office. Often, too, they come because the family physician insists that as long as they retain certain teeth, they will continue to suffer from rheumatic and digestive disturbances, or other complications attributable to bad teeth. Frequently, however, advice of this kind is given without reference to a careful clinical examination, creating difficulties for the dentist, who ethically is bound to stand by his own opinion and must refuse to perform needless extractions in elderly patients.

Sinaloa Numero 9, 3er. piso, Mexico, D.F., Mexico

An experimental evaluation of the physiology of tooth eruption

L. W. Bryer. *Internat.D.J.* 7:432-478 Sept. 1957

A series of experiments was undertaken to investigate the influence of various dietary, circulatory, surgical and endocrinous disturbances on the mechanism of eruption of the rat's incisor. The results were considered in relation to current theories of tooth eruption. Inconsistencies were evident with regard to the cellular proliferation theory, the alveolar bone growth theory, the pulpal constriction theory and the growth in length theory. The inconsistencies tend to exclude them as principal factors in the production of the eruptive force.

A method was devised to measure the eruptive force in the lower incisor of the rat. The left mandibular incisor was shortened and removed from functional occlusion. The unimpeded eruption

rate was correlated with clinical, roentgenographic and histologic evidence.

The findings suggest that the eruptive force of the rat's incisor is derived primarily from the tissue tension within the pulp and periodontal tissues, which in turn is derived from the blood supply. Other physiological forces may play a subsidiary role in the eruptive mechanism.

University of Oxford, Oxford, England

Influence of glands of internal secretion on dental morphogenesis: conclusions

(Influencia de las glándulas de secreción interna sobre las morfogenesis dentaria: conclusiones)

J. C. Muracciole. *Rev. A.odont.Argentina* 45:78-82 March 1957

Teeth are part of the organism and their morphogenesis and normal development depend on the functional balance of all the factors that have an influence on the organism as a unit, among them the endocrine glands.

Experiments were carried out on white rats which, during the periods of formation and eruption of the teeth, were deprived of some of the endocrine glands (a different gland in each group of animals). The results showed:

1. Parathyroidectomy causes the severest changes in the morphogenesis of dental structures with complete decalcification of the dentin and of the enamel, disorganized formation of the odontoblasts, defects in the dental pulp and malformation of the teeth as they erupt.

2. Thyroidectomy causes moderate hypocalcification in one zone of the dentin owing to changes of the organic substance of the teeth. It interferes with the eruption of the teeth.

3. Adrenalectomy and thymectomy have no effect on the morphogenesis or the eruption of teeth.

4. Gonadectomy (oophorectomy or castration) causes pronounced changes in the morphogenesis of the dental structures. Calcification of dentin is poor and irregular, and the activity of odontoblasts is increased in one zone of the dentin and results in the formation of dentinal buds that obliterate the pulp chamber with disappearance of the organic substances.

The effect of hypophysectomy on the morphogenesis of the dental structures is moderate; the abnormalities of the dentin—irregular and insufficient calcification—are transient. Hypophysectomy and thyroidectomy greatly restrict the eruption and the growth of erupting teeth.

The weekly rate of eruption of teeth was normal or almost normal in all the animals with the exception of those in which hypophysectomy and thyroidectomy had been performed. The decrease in the rate of eruption owing to hypophysectomy is greater than that owing to thyroidectomy. Eruption is completely arrested a few weeks after hypophysectomy is performed.

The results of this part of the experiment show that the eruption and growth of teeth are controlled primarily by the hypophysis through the growth hormone of the anterior lobe and secondarily by the thyroid through the action of thyroxin.

The molars of all the rats in the experiment were studied macroscopically and microscopically after completion of dentition. Only the molars of animals in which gonadectomy had been performed showed the changes caused by gonadectomy that were described earlier.

Callao 1103, Buenos Aires, Argentina

Terms of employment of dental technicians and apprentices

Brit.D.J. 103:451-452 Dec. 17, 1957

The terms and conditions of employment of dental technicians are embodied in agreements reached from time to time by the National Joint Council for the Craft of Dental Technicians. The British Dental Association and the Surgical Instrument Manufacturers' Association represent the employers on the council, and the unions represent the employees.

The present agreements provide for two grades for adult technicians. In Grade I is the dental technician who, in addition to being a good all-round craftsman, is able to carry out crown and bridge work of an advanced nature, advanced orthodontic work, or surgical appliances, or advanced ceramics. In Grade II is the all-round dental technician who has completed five years'

apprenticeship, or who is able to undertake the ordinary processes in a dental laboratory without direct supervision.

The agreed working hours are 44 a week, with time and a quarter for overtime and double time on Sundays and holidays. The minimum weekly wage of a Grade I technician is \$31.50, and that of a Grade II technician, \$26.60. The weekly rate for apprentices rises from \$6.65 in the first year to \$17.29 in the fifth year. Employees are paid for six Bank or Statutory holidays per year plus annual holidays based on one working day holiday for each month of service completed with the same employer prior to May 1 of each year. Employees are entitled to two weeks' sick pay plus six weeks half-pay in any one year, after six months of continuous service.

13 Hill Street, Berkeley Square, London, W.1, England

The doctor and his heart

Fred W. Fitz. *Radiology* 66:225-230 Feb. 1957

Coronary occlusion is responsible for 10 per cent of all deaths in the entire population of the United States but for more than 20 per cent of the deaths of dentists and physicians.

Although this heart condition occurs infrequently in men less than 40 years old, almost 4 per cent of the men dying of coronary disease in the Armed Forces during World War II were less than 25 years old.

Heredity and type of body build are believed to be important factors which should be considered in the pathogenesis, pathophysiology and treatment of coronary occlusion.

Concerning the pathogenesis of an acquired coronary artery narrowing and occluding, most authors who have investigated the course and treatment of this heart condition believe the process to be a disturbance in or an alteration from the normal cholesterol-lipid-lipoprotein metabolism.

Once coronary atherosclerosis has developed, small subinternal hemorrhages occur in the atheromatous plaques, resulting in increase in size of the plaques and in an acute thrombosis of the vessel distal to the point of hemorrhage. In addi-

tion to this syndrome, the gradual deposition of cholesterol-lipid material in the coronary intima may continue until complete obstruction of the arterial lumen occurs.

The important factor determining whether a myocardial infarction follows the coronary obstruction is the rate of the development of the obstruction and the speed of establishing a compensatory collateral circulation.

For dentists and physicians afflicted with myocardial infarction, rest is one of the most important measures, at least during the acute phase. Anticoagulant therapy should be used for long periods of time in the presence of an extreme infarct or any associated disease that might result in slowing the flow of blood through the circulatory system.

Maintenance of normal weight, intellectual and emotional equanimity, appropriate exercise, and avoidance of any vasoconstrictor habits (including smoking) are important in the prevention or postponement of a second coronary occlusion.

238 South Laverne, Chicago 44, Ill.

Studies on masticatory function

II. The swallowing threshold of persons with normal occlusion and malocclusion

Y. Kawamura and M. Nobuhara. *M.J.Osaka Univ.* 8:241-246 June 1957

Sixteen persons with comparatively good dentitions and 22 persons with various kinds of abnormal dentitions were given five pieces of peanut and were instructed to chew and swallow them in their usual way. The number of chews and the time (in seconds) required for mastication were recorded. The experimenter observed the subjects through a window in a screen. Ten trials were made with each subject and the mean values confirmed.

Generally, subjects with malocclusion took longer to masticate, and chewed many times more than subjects with normal occlusion. Furthermore, the subjects with malocclusion showed pronounced variations in the number of chews and the time required for chewing in each trial. Subjects with normal occlusion were comparatively constant in the number of chews and the

time required for chewing in each trial; they masticated food with a rhythmic mandibular motion and confirmed Dahlberg's observation that habit is a major factor in mastication.

Dental School, Osaka University, Osaka, Japan

Investigations of dental caries 75 years ago (Zahnkariesuntersuchungen vor 75 Jahren)

D. Hoffmann. *Zahnärztl.Praxis* 8:12 Sept. 15, 1957

During the nineteenth century, many scientists the world over were actively interested in solving the problem of the etiology of dental caries. The "chemical theory," based on results of experiments in which extracted teeth had been treated with different acids, thereby artificially producing carious lesions, was strongly promoted by M. Schlenker of the Collegium Medico-Chirurgicum of the University of Tübingen, Germany.

Schlenker, who called himself a qualified surgeon, gynecologist and dentist, practiced these medical and dental specialties first in Germany and later in St. Gallen, Switzerland.

His main work on the genesis of caries was awarded a special award at the World Exhibition in Paris in 1878. Schlenker reported in this monograph on studies carried out by him and others which led to the following conclusion: "Acids and only acids can produce dental caries. If significant in strength these acids attack not only the roots but permeate the enamel, decompose gradually all tooth structures and promote cavity formations."

In 1882, Schlenker's work, *Investigations of Dental Decay Written for Dentists, Physicians and Surgeons as Well as for Educated Laymen*, described his experimental procedures.

Schlenker also investigated the relation existing between human saliva, gastric juices and carbohydrates in the development of caries. He reported: "A tooth soaked for four days in a solution containing saccharose and human saliva shows macroscopically no pathologic changes but a significant decrease in weight."

The unfavorable influence of acidic fruits (sour cherries, currants, blackberries, strawberries, all types of citrus fruit and grapes) on the tooth

structures was demonstrated in Schlenker's experiments.

Schlenker concluded his thesis on the chemical theory of the genesis of dental caries as follows: "Dental caries unquestionably is purely a chemical process. Without the presence of acids there can be no caries. Acids are constantly introduced into the oral cavity as follows: (1) through intake of acidiferous foodstuffs; (2) through bacteria forming lactic or acetic acids, and (3) through gaseous acids coming from the digestive apparatus."

Another theory on the etiology of caries which had been advocated by many of his contemporaries, that caries develops by changes in the "world of molecules and atoms," Schlenker rejected energetically with these words: "If this fantastic hypothesis would contain a bit of truth, there could be no human on earth, primitive man, Negro or Eskimo, with a single healthy tooth in his mouth."

13b, München-Gräfelfing, Germany

Treatment of glossalgia

(O lechenii glossalgii)

M. A. Makienko. *Stomat., Moscow* 36:3:23-25
May-June 1957

Glossalgia is characterized by hypertrophy of the foliate papillae of the tongue. The mucous membrane between the folds of these papillae is scarred and eroded. Glossalgia is accompanied by pain which varies in direct proportion to the size of the hypertrophied regions. Histologic examination of the inflamed regions reveals a hyperplasia of the tongue's lymph follicles.

This condition is not the result of irritation caused by teeth or dental restorations, but is secondary to constitutional diseases such as hormonal alterations, gastrointestinal disorders and neurogenic disturbances. The treatment of glossalgia involves general treatment of the patient as a whole and local treatment of the inflamed region.

In the Medical Institute of Kuibishev a new method of treating glossalgia locally, proposed by A. A. Amenew, has been used with satisfactory results. It is assumed that the hypertrophied

papillae have irritated the nerve endings and that the pain can be controlled by anesthetizing the involved regions.

A topical anesthetic was applied daily to the lateral surface at the base of the tongue. Improvement was noticeable after from 15 to 20 days, and after 30 applications the symptoms disappeared. In more severe instances of glossalgia an alcohol-procaine hydrochloride block was applied, to obtain an anesthesia which endured for from eight to ten days. Usually, three such applications given at ten day intervals were sufficient for the papillae to return to normal. Only 3 of 60 injections of alcohol resulted in necrotization of the mucous membrane, which, however, healed rapidly.

The treatment was applied to 42 patients whose ages ranged from 28 to 65 years, observed for from one and a half to five years. Positive results were obtained in 40 patients, of whom 28 recovered and 12 improved. Ten patients who received only topical anesthesia improved; of five patients treated with alcohol injections and topical anesthesia, three recovered and two improved; of 27 patients treated with block anesthesia, 15 recovered, 10 improved and 2 did not improve.

Medghis, Petrovka 12, Moscow, U.S.S.R.

Prosthetic clinics at Bombay hospitals

Editorial. *J. All India D.A.* 29:212-213
Oct. 1957

The government has placed in operation a plan whereby dental clinics supply complete upper and lower dentures to the poor at a nominal cost of \$2.10. The plan is now functioning at various clinics.

This scheme of the government is laudable. It aims at helping the poor masticate food thoroughly so that proper digestion is achieved, and it promotes improvement in the national health standards.

The way in which the scheme has been put into effect, however, is objectionable. To meet the demand, dentures are being produced hastily in large numbers, and are likely to be defective in quality and fit. If a teaching institution con-

centrates on the mass production of dentures irrespective of quality, the regular teaching of the student suffers, the staff is overburdened, and the routine work of the college and hospital is neglected or disorganized.

Care must be taken to see that well-to-do or undeserving persons do not take advantage of the scheme. The scheme should function in such a way that the students and staff are not overworked, and that only deserving persons receive the dentures.

Relief centers should be opened by the government, and should be independent of teaching institutions. Such centers could employ new graduates, and could supply dentures to the needy and the poor at no cost whatsoever. If the government believes that patients with moderate means also should be served at the relief centers, graduated fees should be charged after ascertaining the income and circumstances of such patients.

General Assurance Building, 232, Dr. Dadabhai Navroji Road, Bombay 1, India

Association finance

Editorial. *Brit.D.J.* 103:315-316 Nov. 5, 1957

In common with all other organizations, the British Dental Association is faced with the problem of seriously increased costs. In an effort to reduce expenses, a finances review subcommittee was set up which investigated in the minutest detail every aspect of Association expenditure. The committee found no evidence of waste or unnecessary spending, and established that the greatest economy already was being exercised. The continual rise in the cost of such expenses as rent, taxes, repairs, lighting, heating, salaries, postage, telephone, stationery, printing and other items is beyond the control of the Association, as it is beyond the control of the dentist in his practice.

The annual conference always involves some cost, but it is an important event and a valuable shopwindow for dentistry. The annual meeting of members must be held to comply with the law, and the scientific and social events form a natural corollary. The administrative bodies and the various working committees of the Association

together account for less than 15 per cent of the Association's income. It was suggested that economies might be effected by reducing the membership of some of them. The board debated this and decided that a reduction in the membership of the Representative Board would be the only economy that would not impair the working of the Association.

The Association needs more money. A special committee on which the rank and file of the membership was represented has investigated its finance and can see no way of effecting any appreciable economy. Clearly, therefore, an increase in the annual subscription is inevitable and will have to be made in the near future.

13 Hill Street, Berkeley Square, London, W.1, England

The organization of a modern dental practice

V. R. Jennings. *Australian D.J.* 2:200-210 Aug. 1957

The purchase price of a dental practice consists of the value of the equipment and instruments, furniture, floor coverings and stock, plus the value of good will. In Victoria the value of good will generally is about a third of the gross income irrespective of locality; in New South Wales it varies according to the demand at the time of sale and also between locations. Roughly it represents the loss of income a dentist would suffer if he were to "squat" in an area while building up his income from nothing to an income similar to that of the practice purchased. The highest price for good will is paid for a conservative practice in the professional part of the city, such as Melbourne's Collins Street or Sydney's Macquarie Street. The value of good will is about a third of a basic year's income in a residential suburb and about a quarter of a year's income in an industrial suburb. Country practices are sold for lower prices because most dentists wish to remain in the city.

Other factors influencing the value of good will are the type of building, type of suite, location of the suite and security of tenure.

In Sydney, most dental supply houses will ar-

range a short-term loan to a purchaser up to the value of the equipment. This is repayable in two years on 24 promissory notes at 8 per cent interest. Such loans generally are limited to \$2,800 or \$3,500.

For a partnership to be a success it should offer economic benefit to each partner; generally a practice would need to gross at least \$22,400 a year, with the prospects of expansion, to meet this requirement. With a partnership better service may be made available to patients, and more leisure available to each partner. If both dentists are unknown to each other, a trial period of three to six months is desirable. The hours to be worked and holidays to be taken must be agreed on. A prerequisite of a successful partnership is that the partners be temperamentally suited to each other and that both are willing to compromise.

Since the end of the war, with the rapid growth of new suburbs and towns, many dentists have succeeded in establishing their own practices, by finding rooms suitable for the purpose in a locality where there was an expanding population. This method has a number of advantages. As nothing is paid for good will, the practice may be financed on a smaller capital outlay. Equipment of one's choice may be installed. The best place to start a new practice is in rooms in a shopping center on a main traffic artery in a new, expanding suburb. Other points to be considered are the size of the school or schools in the area, the number of physicians (generally there are two physicians to one dentist) and the proximity of other dental practices. If the area is chosen with some thought, a sound, prosperous practice invariably results from "squatting."

The owner of a dental practice may lease it if he wishes to travel overseas or because of an extended illness or an accident. For the graduate who has had some experience as an assistant, a lease offers the advantage in that he gains experience in the working control of a practice before purchasing a practice of his own and earns far more by this means than by an assistantship. The amount paid for the lease generally is about 10

per cent of the gross takings of the owner for one year. The lessee pays all expenses such as rent, nurses' and technicians' salaries and supplies, and keeps all profits from the practice.

Most new graduates prefer to find a position as an assistant to an experienced dentist for the purpose of gaining experience under competent guidance before commencing a practice of their own, to give them confidence, and to build up sufficient capital for the purchase of a practice. An assistant usually is required to give assurance that he will stay with the practice for at least a year. The salary paid to an assistant in New South Wales generally is \$58.80 (20 guineas) a week in city and suburban areas, and \$73.50 (25 guineas) in a country area. This salary is reviewed in three to six months. Often a commission is paid for all work. Thus, an assistant would receive a certain amount—say, \$58.80 a week—plus a third of the income from all work done in excess of \$168.00 a week. Part-time assistantships often are available in the suburbs where assistance is required for two or three evenings a week plus Saturday mornings. These positions generally are taken by young dentists employed in government departments where there is no Saturday work and the working day finishes between 4 and 5 P.M. The part-time assistant is paid a commission only—say, a third of all the work done. Sometimes a commission of 40 per cent is given for all operative work, with a commission of 20 per cent being accorded for prosthetics.

A locum tenens usually is paid more than an assistant. In New South Wales the salary generally is about \$88.20 a week in the metropolitan area, with a higher rate in the country.

In comparison with these salaries, a dental officer in the services receives about \$88.20 a week plus keep (this includes the gratuity of \$350 a year). In the Victorian School Dental Service the salary is about \$112.00 a week. The dental officers are also entitled to superannuation, sick leave and other benefits. The hours of work are congenial, with lengthy holidays.

167 Elizabeth Street, Sydney, Australia

Doctoral and Masters' dissertations

In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.

Pulpal reactions following surgical amputations in rat molars. *Osamu Miyamoto*. 1957. M.S. University of Illinois.

Physiologic migration of anterior teeth. *Bernard Joseph Schneider*. 1957. M.S. University of Illinois.

Antibacterial action of certain fluoride containing dental restorative materials. *Sudarshan L. Mangi*. 1957 M.S.D. Indiana University.

Surgical corrections for maxillary prosthesis. *Robert Emmett Silha*. 1957. M.S. State University of Iowa.

A histopathologic study of nerve sclerosants. *Allen Jesse Koslin*. 1957. M.S. State University of Iowa.

Experimental studies on tooth plantation in the Syrian hamster. *Robert Boer Hoek*. 1957. M.S. University of Michigan.

Innervation of the human periodontal membrane and gingiva. *William Donald Kirstine*. 1957. M.S. University of Michigan.

Effect of the administration of steroid hormones on the gingival tissues. *Samuel Krohn*. 1957. M.S. University of Michigan.

A roentgenographic cephalometric appraisal of rest position relative to the presence or absence of tonsillar and adenoid tissue. *Darrel G. Moreland*. 1958. M.S.D. University of Nebraska.

A three dimensional study of the adult temporomandibular articulation. *Louis Goldblatt*. 1957. M.S. University of Pittsburgh.

An analysis of normal cases and Class II Division 1 cases—cephalometric evaluation. *Rudolph Martin*. 1957. M.S. University of Pittsburgh.

The effect of an antihistamine, Co-Pyronil, on the incorporation of cysteine into healing wound tissue. *Nicholas James Perino*. 1956. M.S. Washington University.

A cephalometric analysis of mandibular incisor and molar movements in excessive curve of Spee reductions. *Benjamin Williamson Lewis*. 1957. M.S. University of North Carolina.

A comparison of the maxillary arch and nasal septum of cleft palate patients with noncleft palate patients, using posterior-anterior cephalometric projections. *Philip Bader*. 1957. M.S. Saint Louis University.

The correlation of skeletal pattern and soft tissue conformation in excellent adult female faces as revealed in lateral cephalometric roentgenograms. *Bailey Warwick Prichard*. 1957. M.S. University of Tennessee.

A study of nasion as a cephalometric landmark. *Russell Payne Greer*. 1957. M.S. University of Tennessee.

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